THE FACTORS BEHIND THE INCREASING TREND IN THE USE OF DIAGNOSTIC IMAGING IN THE PHILIPPINE GENERAL HOSPITAL FROM THE RADIOLOGISTS’ POINT OF VIEW

DANLEN C. MASANGYA, MD
JOHANNA PATRICIA A. CAÑAL, MD, MHA, FPCR

ABSTRACT
This study aims to obtain the perspective of radiologists on the increasing demand for and possible perceived utility of radiologic examinations in the UP-Philippine General Hospital (UP-PGH). This is a descriptive study wherein information was collected through the use of a questionnaire adapted from the parent study conducted in Norway in 2009. A total of 44 consultants, fellows and resident physicians of the UP-PGH Department of Radiology participated in this study. In the questionnaire, the radiologists were asked to rate the frequency of potential causes of increased demand for diagnostic imaging, their level of participation in the decision making of requesting physicians, and their perceived role in patient care using five-point scales. Responses were analyzed and ranked using the Likert scoring system, and grouped and ranked using Factor Analysis. According to the respondents, the most important causes of increased volume of radiologic examinations are the lack of communication between radiologists and requesting physicians, and the availability of new imaging technology. Repeated examinations and vague referrals contribute to unnecessary investigations. These can be addressed by maintaining a healthy relationship between the clinician and radiologist, as well as with the formulation of hospital policies that will ensure the appropriate allocation of limited resources.

INTRODUCTION
In the past few years, there has been an increasing trend in the use of diagnostic imaging in the clinical setting. In the UP-Philippine General Hospital (UP-PGH) Department of Radiology, there has a significant increase in the number of radiologic examinations being performed on a daily basis – around 1.5 to 2.5 times larger compared to the number of examinations done during the same period the previous year. This has resulted in considerable delays in the scheduling of examinations.

The increased use of imaging modalities that employ the use of radiation translates to increased radiation dose for patients, or more patients receiving radiation. Pediatric patients are especially vulnerable since children are more sensitive to the effects of radiation, have a longer life expectancy compared to adults, and may receive higher doses of radiation per study per body weight if the proper machine settings are not used.

In addition, increased use of imaging has exponentially increased the cost of healthcare. In the Philippines, where majority of health costs are out-of-pocket, patients must be able to allocate their limited financial resources for both diagnostics and treatment. In the UP-PGH, a significant portion of the budget is utilized to subsidize diagnostic imaging costs.

The increase in the requests for radiologic examinations from attending physicians has
been attributed to various factors, including increased patients' expectations, clinical uncertainty, the advent of defensive medicine, and the lure of incentives with increased revenues. Radiologists are in the best position to educate ordering physicians as to which imaging tests, if any, are most appropriate for any given clinical situation. The objective of this study is to determine the UP-PGH radiologists' perception of the causes of increasing use of radiological investigations. Their perceptions of the mechanisms behind increased and unnecessary use of diagnostic imaging studies can provide important input for managing the increasing numbers of diagnostic imaging examinations and avoiding over-utilization.

OBJECTIVES

General Objectives

1. To obtain radiologists' perspective on the causes of increasing use of radiological investigations, taking into consideration their level of experience.

2. To formulate recommendations to maximize the efficiency and benefits of diagnostic imaging in the management of patients.

Specific Objectives

1. To enumerate the causes that contribute to the increasing demand for and possible irrational use of diagnostic imaging and how strongly they affect the volume of radiological examinations in the Philippine General Hospital.

2. To determine the extent of participation of the radiologist in the decision making process of the referring physician in the scope of diagnostic imaging.

3. To provide specific suggestions to prevent over-utilization of diagnostic imaging in the Philippine General Hospital.

METHODOLOGY

A survey was conducted among the consultants, fellows and resident physicians currently affiliated with the UP-PGH Department of Radiology using a questionnaire adapted from the study by Lysdahl and Hofmann (Appendix A). All consultants, fellows and residents were invited to participate in the study. Informed consent was obtained from each participant. Participation was completely voluntary, and consent was allowed to be revoked for any reason at any time, without any consequences. In the questionnaire, the radiologist was asked to rate potential causes of increased investigation volume and unnecessary investigations using five-point descriptive scales. The radiologists also answered questions regarding the level of his/her participation in the decision-making process of the requesting physician, and his/her perceived role in patient management.

The questionnaires were collected within a week after distribution. The demographics (age, sex, duration of radiology practice) of the participants were noted. Responses were grouped according to the level of experience/designation of the respondent – junior resident (1st-2nd year), senior resident (3rd-4th year), fellow, and
consultant—and were analyzed using the Likert scale. The responses of the participants for the questions with ordinal options were assigned arbitrary values. In addition, Factor Analysis of all the items was performed to group and rank the similar responses and determine which factors contribute the most to the increase in the requests for diagnostic imaging in UP-PGH. Recommendations for better utilization of diagnostic imaging procedures in the UP-PGH were then formulated.

RESULTS AND DISCUSSION

According to the respondents, the most significant factors behind the increase in the volume of radiological examinations in the UP-PGH are the following: 1) referring physicians have less tolerance for uncertainty; 2) expanded clinical indications for radiology; and 3) increased possibilities due to new radiological technology. With increasing threat of litigation due to medical malpractice and widespread accessibility of medical information in the internet to patients and their caregivers, clinicians have less room for error in their diagnosis and management. Moreover, the availability of new imaging modalities and discovery of new applications of existing techniques have also greatly contributed to the increased utilization of diagnostic imaging in daily practice.

It is also interesting to note that most of the residents have subjectively reported that referring physicians have less knowledge about the accurate use of radiology. This is probably due to the fact that the radiology residents receive referrals from fellow trainees who usually have less than 4 years of clinical experience.

The respondents claimed that the following causes of increased radiological examinations occur the most frequently in the UP-PGH: 1) repeating investigations which have already been done; 2) insufficient clinical information and unclear questions in the referral; and 3) over-investigation and investigating too often. Most of these problems can easily be resolved with effective communication among physicians and improved patient-doctor relationship. In the UP-PGH, clinicians are encouraged to furnish the request with the complete clinical impression of the patient. However, requests with incomplete and/or inaccurate patient information are still encountered in the department. Sadly, some patients repeatedly undergo the same examinations because their requesting physicians forget to verify with them or the co-managing services if these have already been performed.

When asked about the factors that may prevent them from doing a questionable examination, the radiologists ranked the following the highest: 1) high risk of serious complications or side effects; 2) the patient or guardian does not want the examination; and 3) the examination requires a high radiation dose. As radiologists, the respondents are more aware of the adverse effects of radiation and are thus more conscious when it comes to limiting radiation doses of patients.

Meanwhile, the factors that greatly contribute to performing the examination as requested are: 1) great respect for the referring physician’s professional judgment; 2) the patient/guardian wants the examination; and 3) fear of legal consequences and demand for efficiency at work. A high reimbursement rate apparently does not affect the decision of radiologists to carry out questionable requests.

The respondents are generally in agreement with the following statements: 1) radiologists gain professional respect when
they actively discuss with and guide clinicians in the appropriate use of radiology; 2) radiologists have part of the responsibility for limiting total health costs in the Philippine General Hospital; and 3) patients’ confidence in their physician is swayed if the radiologist questions the referral. These statements showcase the perceived importance of the role of the radiologist in the overall management of patients, their willingness to share their expertise in the correct use of imaging modalities with clinicians, as well as their role in the proper allocation of the limited resources in the hospital. Unsurprisingly, the respondents also generally believe that liberal use of radiology is not cost-effective.

Finally, according to the respondents, unnecessary use of diagnostic examinations mainly results in: 1) unnecessary radiation exposure to patients; 2) reduced access to radiological services for other patients; and 3) fewer resources for other health services. All of these concerns negatively affect patient care directly and thus should be avoided.

Other responses to the questions that were volunteered by the respondents, and that do not fall under the listed items in the checklist, are factors that may or may not be unique to the UP-PGH setting. Some of these include: 1) inflexibility of requesting physicians in following protocols for patient management, or in following orders from a senior; 2) prohibiting in-patients from having their examinations performed in an outside institution; 3) availability of free/low cost payment options for service procedures, decreasing the need to limit examinations; 4) prioritization of private patients; and 5) refusal of requesting services to follow the recommendation of the radiologist.

Factor Analysis and Interpretation

The study shows that there are 4 different latent factors that determine the increasing trend in the use of diagnostic imaging in the Philippine General Hospital. It seems that the increase in trend are influenced by the following underlying factors, in order of decreasing significance: 1) lack of communication between radiologists and requesting physicians regarding appropriate use of diagnostic imaging; 2) patient demand for health assurance and fascination with technology; 3) demand for efficiency from radiologists; and 4) patient and physician insistence on proceeding with the examination.

Overall, the results of the study are quite similar to the results of the study conducted by Lysdahl et al, wherein the most important causes for increased investigation volume are “expanded medical possibilities and supply and demand of services.” Majority of the top responses from this study correspond well with the top responses from the parent study, which suggests that the problems being faced in the setting of UP-PGH are also being encountered in other institutions. Therefore, whatever health policies that may prove beneficial to a particular institution may be applicable to other settings as well.

CONCLUSION

According to the radiologists of the UP-Philippine General Hospital, the most important causes of increased volume of radiological examinations being carried out in the hospital are the requesting physicians’ intolerance for uncertainty, lack of advice from radiologists in selecting the appropriate examination, as well as the availability of novel diagnostic imaging modalities and techniques. Factors that lead to “unnecessary” investigations include repeated investigations and incomplete clinical information in the radiologic request. These factors adversely affect
patient care both directly (i.e., increased radiation dose) and indirectly (i.e., reduced access for other patients). Radiologists play a significant role in decision making for patient management as well as in the proper allocation of hospital resources.

RECOMMENDATIONS

One of the major factors that contribute to the increase in diagnostic imaging tests in the UP-PGH is the lack of effective communication between the radiologist and the requesting physician, leading to unnecessary investigations. Maximizing the benefits of available radiologic technology may be achieved by implementing stricter measures in the screening of radiologic requests before they are approved and carried out, as well as by conducting regular interdepartmental conferences that aim to guide clinicians on requesting the appropriate examinations for their patients. Cost-effective and flexible clinical practice guidelines for the prudent use of diagnostic imaging may also be developed.

To address the factors that might be unique to the UP-PGH setting, the investigator recommends the following: 1) maintain open and respectful communication between the radiologist and the requesting physician; 2) remind clinicians not to take guidelines as universal truths, and manage their patients on a case-to-case basis; and lastly, 3) prioritize patients based on need and not on their capacity to pay. Hospital policies, including pricing of examinations, should be reviewed thoroughly to ensure fair distribution of limited resources, particularly in the UP-Philippine General Hospital.

Further studies may be done to determine the magnitude of the effect of the other factors volunteered by the respondents that may be unique to the UP-PGH setting and to formulate the necessary policies to resolve such issues. Likewise, the investigator recommends conducting similar studies involving more radiologists to examine similarities and differences among institutions.

REFERENCES


NOVEL CLASSIFICATION OF PATTERNS OF STEROID DISTRIBUTION WITHIN THE EPIDURAL SPACE DURING CT-GUIDED L5 AND S1 TRANSFORAMINAL EPIDURAL STEROID INJECTION FOR CHRONIC LOW BACK PAIN

VICTOR ERWIN D. JOCSON, MD
RAMON SANTOS-OCAMPO, MD, FPCR

ABSTRACT

Background:
CT-guided percutaneous epidural steroid injections for chronic low back pains have been widely accepted modality over fluoroscopy guidance because of its established accuracy in needle placement within the spine, thus optimizing drug delivery within the intended compartment, i.e. the epidural space. Unfortunately, no existing classification scheme or system is available documenting the drug distribution within the epidural space that could potentially be utilized to predict treatment responses among patients receiving this form of treatment.

Method:
This is a retrospective cross-sectional study design using CT-guided transforaminal steroid injections performed at L5-S1 levels from 2010-2014 at Makati Medical Center. Ninety four (94) cases were analyzed thru PACS by 4 radiologists. Survey responses in terms of classification of drug distribution within the epidural space were analyzed for inter-rater agreement using Kappa coefficient.

Result:
There is a moderate inter-observer reliability among 4 radiologists. Agreement was at best substantial for epidural classification Class I - IV with Kappa coefficient values from 61.22% to 80.67%. Class V showed moderate agreement with Kappa coefficient at 0.48 or 48.66%. The epidural drug distribution was noted to be predominantly Class II (37.23%). Unilateral radiculopathy is the major baseline symptom with global perceived effect (GPE) described as ‘improved’ at 48.94% after 2 weeks.

Conclusion:
The proposed classification system to evaluate drug distribution within the epidural compartment at L5-S1 during CT-guided steroid injection is simple and reproducible. There is moderate inter-observer reliability among radiologists making this a simple yet robust and reproducible. This can be proposed as a potential standard classification system to predict treatment responses among patients with different types of drug distribution.

INTRODUCTION OF THE STUDY

Chronic back pain is usually defined as back pain that lasts for longer than 7 to 12 weeks. It also refers to pain that persists beyond the expected duration of healing, or a frequently recurring back pain that has been present over a long period. It has also become a diagnosis of convenience for some people who are actually disabled for other socioeconomic, work-related, or psychological reasons. It is acknowledged that the condition may have no well-defined pathological cause. Among the adult population, the annual incidence of back pain of at least moderate intensity and duration has been reported at 10–15%, while the point prevalence was given at 15–30%. The prevalence rises with increasing age up until 65 years, during which age it begins to drop off for unknown reasons. However, published epidemiological data may actually be an underestimation due to the fact that most sources of information, such as those from national insurance and industrial sectors, include only individuals in whose symptoms result to loss of days at work or disability.

Back pain is the most common cause of activity limitation for people below 45 years old in the US. It is the second most frequent reason for physician visits, the fifth-ranking cause of admission to hospitals, and the third most common cause of surgical procedures. In the Philippines, prevalence of sufferers from chronic low back pains has been increasing. It is no
longer an affliction of the growing population but has since become a common disability related to work. In the authors’ outpatient clinic in an urban tertiary center currently, at least 2 to 3 consultations with subsequent spine injections for chronic back pain are seen weekly.

Lumbar radiculopathy
The particular spectrum of patients covered by this research would typically have lumbar radiculopathy coinciding with the dermatomal distribution of L5 and S1. Pain may be distributed in a specific nerve root pattern as follows:

L3: hip, thigh, and knee: nerve root
L4: hip, thigh, knee, and medial leg
L5: hip, lateral thigh, and leg
S1: buttck, posterior thigh, and calf

Anatomic variations can, however, exist in the abovementioned, and entire nerve root distributions may not be affected in the early stages of radiculopathy.

Epidural steroids injections
Epidural steroids injections (ESI) are used in the treatment of radicular and discogenic pain emanating from the cervical, thoracic, and lumbar spine, such as caused by a herniated disc, degenerative disc disease, or spinal stenosis. It uses a preparation of a corticosteroid, which is a strong anti-inflammatory drug, combined with a local anesthetic. The former take pressure off nerves and alleviate pain by relieving soft tissue swelling, while the latter is given to provide immediate pain relief. Onset of relief with corticosteroids takes longer than with anesthetics. The goal of an epidural injection is to deliver the active medication as close as possible to the target tissue to minimize systemic effects (vs. oral steroids). 3 Interventional radiology, with fluoroscopic or computed tomography (CT) guidance, plays a strong role in the management of chronic low back pains. These approaches most frequently utilize three access routes: caudal, interlaminar, and transforaminal. Of these, the interlaminar route is the most common. It is performed by injecting the medication immediately adjacent to the dural sac in the posterior spinal column, with a subsequent diffusion to the herniated disc or other inflamed, irritated, or impinged neural structures. However, since the sensory neural fibers are predominantly located in the ventral epidural space, it has long been debated whether a transforaminal approach might give the best clinical response among the types of spine injections. 3, 4 In US and Canada, fluoroscopic guidance of needle placement has been routinely used for economic reasons, despite superiority of the CT-guided approach. 2 Among European centers (particularly in Germany), paradigm shift to the latter has dramatically improved overall technical success of the procedure. Nonetheless, fluoroscopic guidance has improved accuracy of injection placements from non-image guided techniques, but the effect on clinical outcome remains unclear. 4

Since this procedure introduction at Makati Medical Center, CT-guided transforaminal lumbar epidural steroid injection at L5-S1 has been performed using standard technique by a qualified interventional radiologist with a fellowship training background (from Brigham and Women’s Hospital and from MD Anderson Center). From late 2010 up to the time of writing, consistent volume of injectate, made of preliminary non-ionic contrast medium and mixture of Methylprednisolone (Depomedrol) plus Bupivacaine (Marcaine) has been consistently used for this specific procedure. Firstly at S1 level, 2ml of nonionic contrast medium is injected followed by CT scanning to assess its distribution within the epidural compartment. Finally, 2ml of Methylprednisolone (Depomedrol) and 1 ml of 0.5% Bupivacaine (Marcaine) are injected transforaminally to distribute within the epidural space. At L5 level, 1ml of nonionic contrast medium is injected within the neural foramen. Finally, 1 ml of Methylprednisolone (Depomedrol) and 1 ml of 0.5% Bupivacaine (Marcaine) are injected transoraminally to distribute within the epidural space. This approach has been unchanged from 2010 up to the present.

REVIEW OF RELATED LITERATURE
Epidural steroid injections are primarily used for reducing inflammation around the nerve root in radicular pain. ESIs should not be repeated within less than two weeks due to the long-acting nature of the steroid preparations used. Optimally, injections should be given with at least four week intervals. Administration should...
not exceed thrice in six months or be more than six in a year. If the desired response is still lacking after two consecutive ESIs, other spinal levels should be chosen for further injections.3, 4 5

Duration of symptoms may play a role in decision making regarding timing of injections. Subacute radicular pain (defined as lasting 3 weeks or longer) that is unresponsive to more conservative measures may form a historical foundation for proceeding with ESI, especially when the presumed etiology is well identified and potentially reversible with a steroid injection. Chronic back pain in exacerbation would also form a basis for performing ESI. The primary goal of ESI for patients with these conditions is to afford some weeks of pain relief, even if only partial, and facilitate spontaneous recovery. It also allows them to tolerate other treatments, which permits more active and aggressive pursuit of rehabilitative goals and restoration of function.3, 4 It is widely debated if transforaminal ESI provides better results than its interlaminar counterpart approach, due to a closer deposition of medication to the site of nerve entrapment using the former technique. Yet, existing studies have shown conflicting results. In a meta-analysis by Chang Chen et al., all high quality studies directly comparing these approaches were reviewed. At two weeks, transforaminal ESI was superior to the interlaminar approach in pain relief by 15%. However, at both one and six months, no differences were found. The combined pain improvements from all five prospective studies revealed a little over 10% difference (transforaminal 54.1% vs. interlaminar 42.7%). As regards to functional improvements, the interlaminar approach was better than the other technique at two weeks (56.4% vs. 49.4%). This was contributed to by an association of direct ipsilateral limb weakness with the transforaminal route. With combined data, the difference was less, at 44.8% and 40.1% for interlaminar and transforaminal ESIs, respectively. Despite the controversy, current trends in practice have demonstrated a shift from the interlaminar method towards the increasingly popular transforaminal approach.5 Lee et al. likewise compared the two approaches by studying 108 patients. In 46 of these (42.6%), the needle was located in the posterolateral epidural space (interlaminar), with 33 (71.7%) achieving pain relief. Of 62 who had the needle located in the anterior epidural position (transforaminal), 42 (68%) were alleviated of pain. There was a significant reduction in pain sense for the posterolateral approach (P < .05), and no statistical difference was found between the two approaches on temporary diagnostic relief. This study concluded that the posterolateral approach is an alternative for the transforaminal technique in cases where needle tip positioning in the anterior epidural space is difficult. It is therefore an endpoint for an interventionalist to aim for a ventral distribution of steroid within this region of the epidural compartment whenever technically possible to optimize benefit.

Pain Analysis

The above diagram shows the conventional visual analog scale (VAS) for pain which usually consists of a line whose ends are labeled ‘no pain’ and ‘pain as bad as it could be’ from both extremes; sometimes this is modified using descriptive terms such as ‘mild’, ‘moderate’ and ‘severe’ (mid) and lastly, using a point-scale system such as 1-10 which is frequently referred to as 10-point numerical rating scale (NRS). These are easily grasped by responders as the continuum scale for pain experience. Although there are many ways to measure low back pain according to Mannion et.al, categorical scales with verbal descriptors and numerical scale appear to be preferable over the traditional visual analog scale; however, there is no single best tool.

SIGNIFICANCE OF STUDY

At the time of this writing, no known CT-based classification system is published in literature analyzing the actual distribution of steroid
within the epidural compartment. If such is devised, it may have a potential for use in helping to predict clinical responses to ESI.

OBJECTIVES

To propose a novel classification system of steroid distribution within the epidural compartment during CT-guided transforaminal L5-S1 steroid injection.

Secondary objectives
1. To determine inter-observer agreement between radiologists
2. Describe patient outcomes of pain relief, functional improvement, and need for repeat ESI of patients;
3. Describe and compare patient outcomes between the different classes of epidural steroid distribution

METHODOLOGY

Study design and population
A retrospective cross-sectional study design was used with images of CT-guided transforaminal steroid injections performed at L5-S1 levels. The study encompassed ESIs indicated by symptomatic radiculopathy and performed by the Section of Interventional Radiology of Makati Medical Center from late 2010 to 2014. Descriptive statistics was used to summarize the clinical outcome of the patients. Frequency and proportion was used for nominal variables. Kappa interrater agreement test was used to determine the inter-observer agreement of the four radiologists on the different outcomes. Fisher’s exact test was used to compare the patient outcomes between different classes of epidural steroid classification. All valid data was included in the analysis. Missing variables was neither replaced nor estimated. Null hypotheses was rejected at 0.05 alpha level of significance. STATA 12 was used for data processing and analysis.

Sample size computation

Legend

\[ z_\alpha = 1.96 \]
\[ z_\beta = z_{0.20} = 0.84 \]
\[ Q_0 = \text{the Q-statistic} = 1.00 \text{ (from Q-statistic table)} \]
\[ Q_1 = \text{the Q-statistic based on the expected highest kappa value (0.900)} = 0.542 \text{ (from Q-statistic table)} \]
\[ 0 = \text{the expected kappa value} = 0.0 \]
\[ 1 = \text{the expected highest kappa value} = 0.9 \]

Sample Size Formula

\[
N = \frac{z_\alpha Q_0 z_\beta Q_1}{Q_0 - Q_1}^2
\]

Sample size computation

\[
N = \frac{1.96 1.00 0.84 0.542}{1.0 0.9}^2
\]
\[ N = 2.578 \]
\[ N = 0.1 \]
\[ N = 665 \]

Sample size can be adjusted for small population (100) using this formula:

\[
N_{\text{adj}} = \frac{N_{\text{Population}} N_{\text{Computed}}}{N_{\text{Population}} + N_{\text{Computed}}}
\]
\[ N = \sqrt{100 \times 665} \]
\[ N = 100 \times 665 \]
\[ N = \sqrt{99750} \]
\[ N = 8 \]
\[ N = 5 \]
\[ N = 87 \]

Therefore, the required sample size for this study was at least 87 patients.

Data Collection Method
About 128 procedures were performed during the period. Since its inception in late 2010, the Section of Interventional Radiology, Makati Medical Center has had significant flux of outpatient consults and percutaneous spine procedures for low back pain indications. Referrals from orthopedic service predominate, with varying spine injections, including facet joint injections, epidural injections, and selective nerve blocks being performed on a regular basis during this time frame.

CT images were accessed via the PACS system of the radiology department. The representative images of each case were analyzed by a review team composed of four radiologists: (1) a senior radiology resident (2) a CT-MRI fellow (3) a consultant in diagnostic radiology and (4) an interventional radiologist. All of them were presented with unlabeled images of each case, and asked to classify the epidural steroid distribution as follows:

Class I – circumferential
Class II – ventral Class III - lateral Class IV – dorsal
Class V – extracanalicular (predominantly foraminal)

Figures 1 4. To help facilitate classification, an analog clock is used for visual comparison.
Figure 2: Proposed Classification System for Epidural Steroid Distribution during Transforaminal Steroid Injection at L5 and S1 levels.

Inclusion Criteria:
A total of 128 patients from late 2010 to 2014 were analyzed on the PACS. Of the 128 patients, extrapolation of data was limited to patients with CT-guided epidural steroid injections performed only at L5 and S1 levels. Using our statistical strategy to satisfy inter-observer agreement among 3 levels of radiologists (resident and fellow (trainee), diagnostic radiologist and interventional consultant), we required at least 87 cases to draw a conclusion. This was met considering the number of cases >87 performed at Makati Med during 2010-2014 period.

Exclusion Criteria:
Of the 128 cases from 2010-2014, those CT-guided epidural injections performed at any levels other than L5 and S1 were excluded.

Plan of analysis
Clinical characteristics of the patients and patient outcomes will be described using frequency (%) for nominal variables, median (range) for ordinal variables, and mean (SD) for interval/ratio variables. To fulfill the first objective, which is to determine inter-observer agreement, kappa coefficients will be calculated.

To fulfill the second objective, which is to describe patient outcomes in terms of pain relief and functional improvement, we will use qualitative thematic analysis based on patient reports on follow-ups. The need for repeat ESI will be reported in terms of proportion of patients who had at least a second ESI, and to correlate if this corresponds to effectivity or non-effectivity of the previous injection/s.

To fulfill the third objective, we will compare both quantitative and qualitative reports on patient outcomes across the different classes of epidural steroid distribution.

ETHICAL CONSIDERATION
All data gathered from patients’ records and files was kept confidential, reviewed and seen by the primary and co-investigators only. A unique alphanumeric code was issued to each research subject and the subjects’ names did not appear on any of the written documents of the surveys. The data were stored in the primary investigator’s personal database, password-protected, and projected duration of storage was at least ten years.

RESULTS
We included a total of 94 patients for the survey assessment to demonstrate epidural injections performed at L5 and S1 levels. Significant agreement between raters was found for all outcomes, from Class I to V (Table 1). Inter-rater agreement was at best substantial for epidural classification Class I - IV (i.e., circumferential, ventral, lateral, and dorsal), Kappa coefficient showed that the rater agreement on these classes was from 61.22% to 80.67%. Only Class V (foraminal or extracanalicular) presented with moderate agreement (Kappa coefficient = 0.48 or 48.66%).
Table 1. Inter-observer agreement of the four radiologists

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Kappa coefficient</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I (circumferential)</td>
<td>0.7280</td>
<td>0.000</td>
</tr>
<tr>
<td>Class II (ventral)</td>
<td>0.8067</td>
<td>0.000</td>
</tr>
<tr>
<td>Class III (lateral)</td>
<td>0.6122</td>
<td>0.000</td>
</tr>
<tr>
<td>Class IV (dorsal)</td>
<td>0.6411</td>
<td>0.000</td>
</tr>
<tr>
<td>Class V (foraminal or extracanalicular)</td>
<td>0.4866</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The epidural steroid distribution was noted to be Class II for 35/94 (37.23%) majority of the patients, while 29/94 (30.85%) were undocumented (Table 2). Among all these patients, 37/94 (39.36%) had no baseline symptom, while the majority of symptomatic patients presented with right-sided radiculopathy (25.53%). There were 15/94 (15.96%) patients who complained of bilateral radiculopathy. The global perceived effect at two weeks after injection was mostly ‘improved’ at (48.94%) and there were undocumented patients (40.43%). For those who needed repeat ESI, 56 patients were documented, of which only 10/94 (10.64%) patients needed it.

Table 2. Clinical outcome of the patients (n=94)

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I (circumferential)</td>
<td>14 (14.89)</td>
</tr>
<tr>
<td>Class II (ventral)</td>
<td>35 (37.23)</td>
</tr>
<tr>
<td>Class III (lateral)</td>
<td>10 (10.64)</td>
</tr>
<tr>
<td>Class IV (dorsal)</td>
<td>5 (5.32)</td>
</tr>
<tr>
<td>Class V (foraminal or extracanalicular)</td>
<td>1 (1.06)</td>
</tr>
<tr>
<td>Undocumented</td>
<td>29 (30.85)</td>
</tr>
<tr>
<td>Baseline symptoms</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>No Contact</td>
<td>37 (39.36)</td>
</tr>
<tr>
<td>Radiculopathy Right</td>
<td>24 (25.53)</td>
</tr>
<tr>
<td>Radiculopathy Left</td>
<td>18 (19.15)</td>
</tr>
<tr>
<td>Bilateral</td>
<td>15 (15.96)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GPE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No improvement</td>
<td>2 (2.13)</td>
</tr>
<tr>
<td>Slightly improved</td>
<td>8 (8.51)</td>
</tr>
<tr>
<td>Improved</td>
<td>46 (48.94)</td>
</tr>
<tr>
<td>Undocumented</td>
<td>38 (40.43)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Need for repeat ESI</th>
<th></th>
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<tbody>
<tr>
<td>Yes</td>
<td>10 (10.64)</td>
</tr>
<tr>
<td>No</td>
<td>46 (48.94)</td>
</tr>
<tr>
<td>Undocumented</td>
<td>38 (40.43)</td>
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</tbody>
</table>
We compared these clinical outcomes among the five epidural classifications (Table 3). There were noted significant differences among these classes in terms of GPE (p-value=0.000) and need for repeat ESI (p-value=0.000). For GPE, only one patient was Class V and still had slight improvement. Majority were in class II, mostly improved (95.45%). Those who needed repeat ESI, one patient was classified Class II and Class V. Class I and IV had 3 patients each who needed repeat ESI.

Table 3. Clinical outcome comparison of the patients by Epidural classification

<table>
<thead>
<tr>
<th>Baseline symptoms</th>
<th>Class I (n=14)</th>
<th>Class II (n=35)</th>
<th>Class III (n=10)</th>
<th>Class IV (n=5)</th>
<th>Class V (n=1)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Contact</td>
<td>6 (42.86)</td>
<td>13 (37.14)</td>
<td>4 (40)</td>
<td>2 (20)</td>
<td>0</td>
<td>0.794</td>
</tr>
<tr>
<td>Radiculopathy Right</td>
<td>4 (28.57)</td>
<td>7 (20)</td>
<td>4 (40)</td>
<td>1 (20)</td>
<td>1 (100)</td>
<td></td>
</tr>
<tr>
<td>Radiculopathy Left</td>
<td>1 (7.14)</td>
<td>9 (25.71)</td>
<td>2 (20)</td>
<td>1 (20)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bilateral</td>
<td>3 (21.43)</td>
<td>6 (17.14)</td>
<td>0</td>
<td>1 (20)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>GPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>No improvement</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2 (66.67)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Slightly improved</td>
<td>3 (37.50)</td>
<td>1 (4.55)</td>
<td>0</td>
<td>1 (33.33)</td>
<td>1 (100)</td>
<td></td>
</tr>
<tr>
<td>Improved</td>
<td>5 (62.50)</td>
<td>21 (95.45)</td>
<td>6 (100)</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Need for repeat ESI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Yes</td>
<td>3 (37.50)</td>
<td>1 (4.55)</td>
<td>0</td>
<td>3 (100)</td>
<td>1 (100)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5 (62.50)</td>
<td>21 (95.45)</td>
<td>6 (100)</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Statistical test: Fisher’s Exact test

Of the 94 cases, all (4) responders have agreement in 64 cases (68%). In fact, using a 3-rater agreement scheme, inter-observer agreement is increased to 72 or 76.5%. There was not a single case were all radiologists gave a totally discrepant response or classification. Based on the above distribution, we can also extrapolate that most procedures achieved the presumably desired ventral distribution of injectate (steroids) at 49/94 or 52% of the cases, i.e. combined Classes I and II. At 2 weeks post-injection, nearly all patients with follow-ups showed signs of improvement described as ‘improved’ based on GPE or global perceived effect. For the distant patient from 2010-2013,
GPE using same NRS scheme likewise showed overall improvement trend during the specified coverage period of steroid treatment effect. However, responses from these patients may have been affected by recall bias. Overall, majority of favorable outcomes showed Classes I and II epidural steroid distributions.

Among the 94 patients included in this study, only 57 patients had at least one follow-up to assess treatment response. It has to be emphasized that among these patients available for inquiry, about 32 (56%) had a complex presentation of symptoms which include both back pains and radiculopathy. Although there are many methods of pain assessment as proposed by Munnion et.al. the 10-pt NRS (numerical rating scale) was used for practical purposes. Patients throughout the time frame between 2010 and 2013 had records of baseline symptoms prior to injections, but unfortunately, no standardized and validated questionnaires were used to ask about the global perceived effect (GPE) at least 2 weeks after their injections. This complicates issues about recall bias.

The primary author of this paper has only been involved in the index patients from 2014 during his fellowship training. No standardized questionnaires were used on previous records to give accounts on treatment responses from patients of 2010-2013. If validated or standardized questionnaires will be applied retrospectively to reassess every index patient, there will be an issue of ‘recall bias’. This is the limitation of this study, hence, only descriptive trend of treatment responses based on GPE at 2 weeks post-injection can be extrapolated without any statistically significant conclusion as to which drug distribution is the most superior among five (5) class possibilities.

Overall, despite unanimous agreement among radiologists that only about 51% (48 out of 94 cases) showed, at the least, the desired ventral epidural distribution of drugs (combined Class I and II), the trend of positive improvement in terms of global perceived effect is seen in nearly all patients regardless of the drug distribution. It may be better among those with ventral epidural distribution.

The need for repeat treatment in our study varies and does not equate directly to treatment effectiveness. More than half of patients with follow-ups requested repeat treatment after 3 months on the basis that they were satisfied with

GPE using same NRS scheme likewise showed overall improvement trend during the specified coverage period of steroid treatment effect. However, responses from these patients may have been affected by recall bias. Overall, majority of favorable outcomes showed Classes I and II epidural steroid distributions.

Patients whose injectate falls within Class IV (dorsal) likewise showed to be the least responder among the group. Remarkably, the only patient which showed Class V (extracanicular/foraminal) still showed slight improvement of symptoms, but initially less improved quality of life perhaps due to preferential foraminal distribution of the combined steroids-anesthetic rendering the patient transiently immobile. Most responders claimed to have stopped the intake (or at least lessen the frequency) of the pain medications for the next 3 months post treatment.

DISCUSSION:

The inter-observer agreement among radiologists in all presented cases (n=94) is about 68% using a 4- rater agreement scheme with the above mentioned kappa coefficient values. The author initially presumed that this could be due to differences in level of expertise, but extrapolating data from those cases with whom at least 3 radiologists agree actually did not point to a ‘resident surveyor’ being the outlier of the group because such 3-rater agreement scheme occurs randomly.

Fig. 5: representative CT axial images with corresponding classification scheme
known transient effect of the drugs, i.e. instead of
requesting re-treatment because the first injection
was deemed ineffective. Only one patient in the
‘ineffective’ arm did not follow up for a repeat
injection.

Pain assessment and response:

Pain is a very complex symptom but essentially
comprised of two key dimensions of the
experience - pain intensity (how much a person
hurts) and pain affect (how much a person
suffers). Pain is a very complex symptom but essentially
comprised of two key dimensions of the
experience - pain intensity (how much a person
hurts) and pain affect (how much a person
suffers)7.

In a study published by Dawson et.al., it only
showed "fair" to "moderate" agreement between
the 'recalled' versus the 'initial' report of pain
scale among patients. Accuracy was greatest for
queries on frequency, location of pain, and
activities affecting pain. Discrepancies were
noted for queries on severity of pain, with error
bias toward less pain when using the recalled
data. So if there is issue about recall bias,
Bolton et.al. suggested that it is best to use pain
intensity ratings of ‘usual’ pain or pain ‘on
average’ rather than the snapshot of the ‘current’ pain8.

To further complicate the issue of recall bias, in a
prospective study by Marty et.al., pain
recollection beyond 28 days elapsed time interval
only showed good patient recall for parameters of
frequency but only fair recall about the actual
intensity of pain. Whether a single rating scale for
symptoms suffices, or whether pain should be
assessed in terms of frequency as well as intensity
remains unclear. This is beyond the scope of this
paper.

Also, the use of medication is not a surrogate
measure of pain, i.e. two patients taking opioids
may not present the same intensity of pain.
Hence, responses in this study wherein patients
claim to have lessened frequency of pain
medication intake are difficult to validate as
parameter of treatment response.

CONCLUSIONS:

The proposed classification scheme depicting
epidural steroid distribution within the central
canal during CT-guided transforaminal steroid
injections at L5-S1 is simple yet robust and
reproducible. The inter-observer reliability is
about 68% among radiologists in all presented
cases, at best substantial for epidural
classification Class I - IV and moderate
agreement for Class V, with aforementioned
corresponding Kappa coefficient values.

For the purpose of proposing a simple
classification scheme, the authors took the
initiative to render this basic classification as a
good starting point. Again, no such classification
exists at the time of this writing in any literature.
This classification scheme can facilitate further
studies like predictive treatment responses based
on the epidural steroid distribution. This can be
used as assessment tool for any future studies
comparing different approaches like interlaminar
vs. transforaminal or even sacral hiatal
approaches in achieving the presumably desired
ventral drug distribution within the central canal
if such classification can help facilitate this
argument.

The study is limited to describe only the overall
trend of treatment responses among patients
included in this study. This is due to complexity
of symptom presentation, non-use of validated or
standardized questionnaires and issue of recall
bias. Although only half of the cases at 52%
achieved a presumably desired ventral
distribution of drugs within the central canal
(whether isolated or combined distribution), the
positive global perceived effect at 2 weeks post-
injection appear to show only a slightly favorable
outcome compared to other classes of drug
distribution. Thus, this study supports the notion
of theoretical slight advantage of ventral epidural
steroid distribution for optimum outcome. This
remains to be proven.

The proposed classification scheme may be
applicable to other methods of percutaneous CT-
guided injection, i.e. caudal (sacral hiatus) and
interlaminar because this grading system focuses
on drug distribution within the epidural space of
the central canal - only Class V specifically
grouped if any injectate is virtually
extracanaliclar (or foraminal in transforaminal
route of injection). This subset class can
reasonably be substituted for posterior pedicular
or presacral for interlaminar and sacral hiatal approach respectively.

**LIMITATION OF THE STUDY:**

Authors propose the use of validated or standardized questionnaires to assess patients for future studies to assess more reliable treatment responses. This can be a separate paper or study. Hence, this study is only limited to be descriptive in terms of assessing trends of patient responses based on GPE at 2 weeks post-injection. It is practically impossible to draw a conclusion as to which type of steroid distribution is the most superior among classes if no validated or standardized questionnaires would be used to eliminate the issue of recall bias.

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ABSTRACT

Objective: This study aimed to determine the correlation of CT characteristics of pulmonary masses and nodules with histopathologic findings among renal transplant recipients who underwent CT-guided fine needle aspiration biopsy at the National Kidney and Transplant Institute.

Methods: This is 10-year, single-center, retrospective study that included 73 renal transplant recipients who underwent CT-guided percutaneous fine needle aspiration biopsy of pulmonary nodules at NKTI from January 1, 2006 - December 31, 2015 post their transplantation. Pulmonary nodule characteristics: size, number and location were correlated with histopathologic findings. Chi-square test was used to compare proportions or determine association between qualitative variables. Statistical significance was based on p-values ≤ 0.05 level of significance. SPSS v20 was used in data processing and analysis.

Results: A total of 73 patients were included in the study. Average age was 50 years ±12(SD); majority were males (78%). A significant majority of patients had benign histopathology results (86%; p=0.000). Majority of benign lesions were more than 3 cm (44 of 63; 70%). Multiple lesions were most common in the benign group (25 of 63; 40%). Benign lesions were mostly seen in the right upper lobe (20 of 63; 32%).

Conclusion: Based on the analysis of data in this study, there was no significant association between lesion size (p=0.381), number of lesions (p=0.770) and location of lesions (p=0.634) with histopathologic findings. This may be attributed to the very small actual number of patients in this study, which only about 29% of the minimum required sample size of 275. Hence, this conclusion is only applicable to this small sample of renal transplant recipients.

Recommendation: The small sample size is a major limitation to the analysis in this study; hence, further researches involving a larger sample size should be done in order to derive more generalizable conclusions applicable to renal transplant recipients. This can be achieved by doing a multi-center study, by covering longer study period or by doing a cross-sectional study, considering both retrospective and prospective patients who are about to undergo biopsy of pulmonary nodules.¹

¹ Keywords: Pulmonary mass, renal transplant, CT-guided percutaneous fine needle lung aspiration biopsy
ABSTRACT

There are population based studies that report the relationship of breast density as an independent risk factor for the development of Breast Cancer. Most of these studies were performed in the Western countries and limited studies were performed in Asia particularly here in the Philippines. It was said that Asian breasts are denser than our Caucasian counterparts. Breast composition assessment is an essential part of the mammography report and can be obtained by using the ACR Breast Imaging Reporting and Data System (BI-RADS) Lexicon as a guide in estimating breast densities. There are 4 breast composition categories described in the Fifth Edition of the BIRADS Lexicon (see Appendix Table 1).

Various population based studies have demonstrated the following approximate distributions of breast densities: 10% in density Category A, 40% in Category B, 40% in Category C and 10 % in Category D. Therefore about 50% of the screening population has dense breast (1). However, these studies may have failed to include Filipino breast densities as we have a different approximate percentage of breast densities as will be discussed later in this study.

This project research was conducted to document that breast density can be a risk factor for breast cancers among Filipino women. Subjects include Filipino women who underwent breast screening or diagnostic mammography at St. Luke’s Medical Center-Global City and showed positive findings of malignancy after a biopsy procedure.
ABSTRACT

PURPOSE: Data from daily megavoltage computed tomography (MVCT) scans may be used to account for the radiation dose delivered to the bladder of patients who have completed IG-IMRT for nonmetastatic prostate cancer. In this study, MVCT scans were retrospectively analyzed to compare the pretreatment planned bladder dose-volume histogram (DVH) with the actual delivered bladder DVH of these patients. Specifically, the variability between a patient’s pretreatment DVH and his actual DVH with regards to three comparison points (namely, the volume of the bladder receiving 65 Gy, 70 Gy and 75 Gy) was quantified and reproducibility of bladder volumes was assessed. Lastly, a patient’s actual bladder DVH was also compared to the recommended QUANTEC dose constraints with regards to the same three comparison points.

Methods: A total of 950 MVCT image sets were analyzed from 25 high-risk prostate cancer patients treated with Helical TomoTherapy to a dose of 76 Gy in 38 fractions. The bladder was resegmented on each MVCT scan and actual delivered dose received at the end of treatment was recalculated. The percentage of bladder volumes actually receiving 65, 70 and 75 Gy were quantified and compared to the percentage of bladder volumes receiving the same doses based on the pre-treatment simulation scans using the Kolmogorov-Smirnov Test. The Bland-Altman test was used to assess the reproducibility of bladder volumes. A determination on whether the actual delivered bladder volumes receiving each dose was still within the QUANTEC recommended bladder dose constraints was also done.

Results: The desired simulation bladder volume was not met on a daily basis in all 25 patients as documented on their daily pretreatment MVCTs. Despite this, the differences between the pretreatment bladder DVH and the actual delivered bladder DVH with regards to the three comparison points were not statistically significant (p = 0.05). Furthermore, all actual delivered bladder DVH were still well within the recommended QUANTEC dose constraints.

Conclusions: Maintaining a full bladder throughout a 38-fraction radiotherapy course for prostate cancer is difficult due to the onset of cystitis which is a well-known adverse effect of radiotherapy to this region. Although the bladder volume at the time of simulation may differ from actual bladder volume during each treatment fraction, these differences were not significant and did not result in overdosage to the bladder if QUANTEC dose constraints are to be followed. Therefore, bladder preparation protocols in these patients may be modified such that they may be adapted to patient comfort without compromising bladder dose and increasing the risk of acute and late bladder toxicity. However, long-term data is needed before a bladder preparation protocol can be validated.
THE PATIENTS AWARENESS AND ACCEPTABILITY ON BREAST RADIOLOGISTS PERFORMING INITIAL BREAST EVALUATION AND PLANNING THE DIAGNOSTIC WORK-UP DURING A ROUTINE BREAST SCREENING IN A PROJECTED BREAST CLINIC IN A SELECTED HOSPITAL IN DAVAO CITY

NEIL KRISTOFFER P. GAMBOA, MD

ABSTRACT

Objective: This study aims to determine the awareness and acceptability of patients towards breast radiologists performing initial breast evaluation and planning the diagnostic work-up during a routine breast screening in a proposed breast clinic in a selected hospital in Davao City.

Design: This was a cross-sectional study.

Methodology: Using Slovin’s formula, all patients who came for routine screening mammogram and sonomammogram in a selected hospital in Davao City who fulfilled the criteria, from September 1 to October 15, 2016 were included in the study (N= 50). Awareness of patients towards the following were determined: on the existence of breast radiology as a medical specialization, on the existence and role of breast radiologists, on the existence and role of breast clinic, and on which specialty clinic to go in Davao City for routine breast cancer screening. Acceptability of patients towards the following was also determined: on the function of breast radiologists, on the patient’s confidence towards the role of breast radiologists, on the breast center as a facility that is convenient and provides economic benefits. Explanatory Sequential Mixed Method was applied to the study. The qualitative results helped explain and interpret the quantitative results.

Results: Majority of the respondents were aware of breast centers’ functions and the roles of breast radiologists in it but they did not know that are skilled in performing biopsies. Half of them did not know where to find breast radiologists. Majority of the respondents were highly amenable to breasts radiologists doing the initial evaluation, subsequent monitoring and biopsies before being seen by clinicians first.

Conclusions: The author recommends conducting the same study on a larger scope and population, in both private and public hospitals in Davao City. Awareness campaign should also be increased regarding the role of breast radiologist in breast centers.
EVALUATION OF MAMMOGRAPHIC DENSITY:
REPRODUCIBILITY AND CONCORDANCE BETWEEN TWO CLASSIFICATION
SCALES
Author: MARIA ALEGRIA R. ALMAZAR, MD, DPBR
Research Adviser: PETRONILO B. PARUNGAO, J R., MD, FPCR, FUSP, FCT-MRISP
Department of Radiology, De La Salle University-Medical Center
Cavite, Philippines

ABSTRACT

Background: Mammographic density is important for two main reasons: First, the sensitivity of mammography in detecting breast carcinoma is lower in dense breasts because dense fibroglandular tissue may obscure or mask calcifications and masses. Second, there is a direct association between increased mammographic density and increased risk of developing breast cancer. Evaluation of mammographic density could be done either through qualitative or quantitative methods. However, there is currently no worldwide standardized tool to assess it. The lack of gold standard and the use of different classifications may lead to potential problem when classifying mammographic density and assessing potential breast cancer risk.

Objectives: To determine the inter-reader reproducibility when using American College of Radiology (ACR) Breast Imaging-Reporting and Data System (BI-RADS), 5th Edition and Boyd’s Six-Category Classification (SCC) scales in classifying mammographic density. Likewise, the study aims to determine the concordance between the two scales in classifying mammographic density and the composition of the qualitative (pattern-based) BI-RADS scale with respect to quantitative Boyd’s SCC percentage scale of mammographic density.

Methodology: This is a Philippine Health Research Ethics Board (PHREB)-compliant study. The screening mammogram of 30 patients were analyzed by two radiologists using visually assessed (qualitative) BI-RADS lexicon of breast composition and the Semi-automated Computer-Assisted Threshold Technique (quantitative) in Boyd’s SCC percentage scale in classifying mammographic density. Likewise, the study aims to determine the concordance between the two scales in classifying mammographic density and the composition of the qualitative (pattern-based) BI-RADS scale with respect to quantitative Boyd’s SCC percentage scale of mammographic density.

Results: Inter-reader reproducibility between the two radiologists yielded a kappa (κ) of 0.933, 95% CI [0.81, 0.99], p< .001 for BI-RADS and a kappa of 1 for Boyd. Concordance between the two scales resulted in a computed kappa of 1. The composition of qualitative/visually assessed mammographic density patterns of BI-RADS with respect to the quantitatively assessed Boyd’s SCC percentage scale of mammographic density are as follows: almost entirely fatty category are comprise mostly (17%) of the less than (<) 10 percent category and some (10%) belong to the 10-25 percent category of Boyd; BIRADS scattered fibroglandular densities category are mostly (20%) compose of the 25-50 percent with some (3%) belonging in the 10-25 percent category; heterogeneously dense, which may obscure small masses are compose entirely (27%) of the 50-75 percent category of Boyd’s and the extremely dense, which lowers the sensitivity of mammography category in the BI-RADS lexicon include an overlap in the 50-75 and >75 percentage categories (20% and 3% respectively) in Boyd. Nothing of the visually assessed BI-RADS mammographic density was classified into none (0 percent) category of Boyd.

Conclusion: There is excellent inter-reader reproducibility between the two radiologists when visually assessing qualitative mammographic density by using the 5th edition of BI-RADS classification of parenchymal patterns. There is also an excellent (perfect) inter-reader reproducibility between the two radiologists when assessing quantitative mammographic density by using Semi-automated Computer-Assisted Threshold Technique in Boyd’s Six Category Classification of percentage scale of mammographic density. Likewise, there is an excellent (perfect) concordance between BI-RADS and Boyd’s classification scale of mammographic density.
T2-WEIGHTED MR IMAGING OF THE UPPER ABDOMEN: COMPARISON OF SPACE AND HASTE SEQUENCES

JULIAN M. CAÑERO, MD, DPBR, GERARDO L. BELTRAN, MD, FPCR

ABSTRACT

Objective: To assess the suitability of the SPACE sequence for T2-weighted imaging of the upper abdomen by comparing signal to noise ratios of the liver, spleen, and pancreas to HASTE images.

Materials and Methods: Thirty consecutive MRCP and upper abdominal images containing both SPACE and HASTE sequences done at a tertiary hospital from January to March 2015 were reviewed. Quantitative image parameters including signal-to-noise (SNR) and contrast-to-noise (CNR) ratios were measured. Image quality scores in terms of sharpness of organ edges, sharpness of vessel edges, conspicuity of the bile and pancreatic ducts, presence of motion artifacts, and image noise were rated on a scale from 1 to 5 by two readers with at least two years of MRI experience.

Results: SPACE shows significantly increased SNR within the parenchyma of the liver (mean difference: 25.12 ± 6.78, p < 0.001), spleen (mean difference: 45.98 ± 12.95, p < 0.001), and pancreas (mean difference: 32.97 ± 6.58, p < 0.001) compared to HASTE. The spleen to liver CNR was likewise greater in the SPACE sequence. (mean difference: 20.86 ± 8.15, p < 0.001). SPACE was preferred by both readers 68.3% of the time with note of moderate agreement between the observers (κ = 0.493, p = 0.002). SPACE was rated superior to HASTE in terms of sharpness of organs and blood vessels as well as image noise, but rated worse in terms of motion artifacts. No significant difference was seen in the conspicuity of the bile and pancreatic ducts between the two sequences.

Conclusion: SPACE may be recommended as an adjunct sequence in upper abdominal MRI, but may not fully replace HASTE or ETSE in protocols because of contrast concerns and bowel motion artifacts.
SIZE-SPECIFIC DOSE ESTIMATES OF ADULT HEAD, CHEST AND ABDOMINAL MULTIDETECTOR COMPUTED TOMOGRAPHY (MDCT) IN A TERTIARY HOSPITAL IN THE PHILIPPINES

Marte, Alfredo II L., Laya, Bernard F. and Dizon, Mercedes and Pasia, Nelson V.

ABSTRACT

Objectives: This report evaluates and compares the size-specific dose estimates (SSDE) for head, chest and whole abdomen CT examinations of adult patients with internationally published values.

Methods: A cross sectional retrospective review using patients’ database that underwent multidetector computed tomography (MDCT) of the head, chest and whole abdomen at Saint Luke's Medical Center Global City (SLMC-GC) from January to December 2015 was undertaken. Patient's age, sex, body weight, computed tomography dose index volume (CTD1vol) and dose length product (DLP) were gathered and size-specific dose estimates (SSDE) for each patient were determined. Frequency distribution was computed for each categorical variable while descriptive statistics such as mean and standard deviation were generated for all numerical variables including SSDE. To test if SSDE were different between patient profiles, Independent Samples t Test and Analysis of Variance (ANOVA) at 5% level of significance were used.

Results: Of the 1,474 patients aged 40 years old and above included in this study, data from 411 patients with recorded weights were used to determine the relationship of weight and SSDE. The highest SSDE values for plain CT procedures are 14.13 ± 6.32 mGy, 38.6 ± 5.4 mGy, 12.61 ± 5.87 mGy, and 15.05 ± 6.43 mGy for abdomen, head, chest and stonogram respectively. The highest SSDE values for plain with contrast procedures are 38.00 ± 12.74 mGy, 77.2 ± 16.9 mGy, and 26.06 ± 15.61 mGy for the abdomen, head, and chest. There are no significant differences in the SSDE of the lateral, anteroposterior and lateral + anteroposterior dimensions within the different weight ranges. There are however significant differences in the SSDE comparing plain and plain with contrast in all CT procedures. The SSDE values of the lateral, anteroposterior and lateral + anteroposterior dimensions of the plain head CT as well as the SSDE values of these dimensions for the plain with contrast examinations of the head are significantly different. This relationship is not shown in CT procedures of the abdomen, chest and stonogram.

Conclusion: SSDE data taken from Saint Luke's Medical Center Global City (SLMC-GC) are close to internationally published data. For the abdomen and head exams, our data is comparable with published data. However, for the unenhanced chest CT scan our data are lower while SSDE for stonogram are higher than published data. SSDE as a means of estimating patient dose is a more accurate way to communicate radiation exposure to the patient and care givers. It is also a more practical metric to incorporate in the radiologist's report.
LATERAL PATELLAR DISLOCATIONS: A COMPARATIVE MRI STUDY OF QUANTITATIVE AND MORPHOLOGICAL RISK FACTORS OF PATELLOFEMORAL REGIONS IN ST. LUKE’S MEDICAL CENTER, GLOBAL CITY SETTING

ROY ANGELO G. DOMACENA, MD1 AND MARIAEM M. ANDRES, MD1,2
Institute of Radiology, St Luke’s Medical Center, Global City and Quezon City

ABSTRACT

Acute patellar dislocations are common injuries in children, accounting for approximately 9–16% of acute knee trauma in young athletes with hemarthrosis1. Incidence rates in the American setting published in the American Journal of Sports Medicine for ages 10–17 were found to be about 29 per 100,000 persons per year, while the adult population average for this type of injury ranged between 5.8 and 7.0 per 100,000 persons per year. The highest rates of patellar dislocation were found in the youngest age groups, while the rates declined with increasing ages. Recognition of patellar dislocation is important, as it can lead to recurrent patellar instability, chronic anterior knee pain and prolonged limitation of function.

MR imaging is increasingly being applied to the evaluation of pediatric knee injuries, as it provides accurate and timely assessment of bone, cartilage, ligaments, menisci, and adjacent soft tissues. Qualitatively, several morphologic features can be assessed, such as bone signals, cartilage and osteochondral injuries, as well as tendinous and ligamentous defects. Quantitatively, six measurable values can be obtained, namely the lateral trochlear inclination, trochlear facet asymmetry, trochlear depth, tibial tuberosity-trochlear groove distance, sulcus angle, and patellar height ratio.

This is a cross sectional retrospective study. Prospective subjects include pediatric and adult patients diagnosed with lateral patellar dislocation based on MR imaging at St. Luke’s Medical Center in Global City. The data for review was from January 2010 to May 2016.

This study may serve as a guide, both quantitatively and qualitatively, to orthopedic surgeons in the decision making and improvement of patient outcomes in prevention and management of lateral patellar dislocation.
ABSTRACT

Background: The Alberta Stroke Program Early Computed Tomography Scoring (ASPECTS) is a tool to measure early ischemic change in computed tomography scan of the middle cerebral artery territory. It is a method whereby the clinician may be able to prognosticate outcomes of patients with middle cerebral artery territory hyperacute to acute ischemic infarct. With the utilization of MRI via Diffusion Weighted Imaging (DWI) sequence in correlation with Attenuation Diffusion Coefficient (ADC) / Stroke protocol, it is said to be more specific and sensitive in the determination of ischemic stroke and superior to CT scan. Hence in utilizing MRI-DWI / Stroke protocol in accordance with the principle of ASPECTS, the specificity and sensitivity in the detection of middle cerebral artery territory ischemic infarct is better and more accurate. Thus, this study aims to determine and validate its applicability and prognostic ability in in-patients with middle cerebral artery territory ischemic infarct in correlation with length of hospitalization and incidence of mortality.

Methods: This is a retrospective cohort study involving 40 patients admitted in the Philippine Heart Center with diagnosis of middle cerebral artery ischemic infarct with brain MRI Stroke protocol which includes Diffusion Weighted Image (DWI), Attenuation Diffusion Coefficient (ADC), Gradient Echo Sequence (GRE) and Fluid Attenuation Inversion Recovery (FLAIR), of at least 24 hours from onset of neurologic signs or symptoms of stroke using a 1.5T MRI. ASPECT scoring method dichotomized into “Good” and “Poor” DWI-ASPECTS was utilized to assess the ischemic infarct by a fellow of the CT-MRI Society of the Philippines. Correlation between the DWI-ASPECT Scores and mortality and length of hospital stay were assessed to determine prognostic utility.

Results: The DWI-ASPECTS method has a sensitivity of 100%, specificity of 52.63%, positive predictive value of 10%, and negative predictive value of 100% in its prognostic utility correlation with mortality. The DWI-ASPECTS in correlation with length of hospital stay showed that patients “Good” DWI-ASPECTS were likely to have shorter hospital stay while those with “Poor” DWI-ASPECTS had a longer hospital stay.

Conclusion: DWI-ASPECTS is indeed a highly sensitive method that can be utilized to analyze middle cerebral artery strokes with good correlation with length of patient hospitalization. DWI-ASPECTS therefore can be recommended as a tool to assess middle cerebral artery ischemic infarct and predict length of hospitalization.
ROLE OF MULTI-VOXEL MR SPECTROSCOPY IN THE EVALUATION OF WHITE MATTER HYPERINTENSITIES OR LEUKOARAIOSIS OR WHITE MATTER HYPERINTENSITIES IN THE ADULT BRAIN: OUR PRELIMINARY EXPERIENCE

DIANA JANE B. GARCIA, MD, DPBR
Capitol Medical Center
Adviser: HAZEL MARIE CARANDANG-RECIDORO, MD, FPCR

ABSTRACT

OBJECTIVE: The study aimed to assess the metabolic changes in leukoaraiosis or white matter hyperintensities in adult brain using multi-voxel MR spectroscopy. Specifically, the study aimed to determine the metabolite ratios including NAA/Cr, Cho/Cr, and Cho/NAA in white matter hyperintensities and normal-looking white matter in adult brain diagnosed with leukoaraiosis in MRI, compare these findings with the normal white matter, and correlate these metabolic changes with those of infarction, infection, inflammation and neoplastic brain conditions.

SUBJECTS AND METHODOLOGY: The study was participated by 31 adult patients, 35-81 years of age, 17 males and 14 females. The study group is consisted of fifteen participants who have MRI findings of leukoaraiosis and the normal control group is consisted of 16 participants who have normal MRI findings. Both groups were subjected to MR spectroscopy of the brain using a multi-voxel technique. Spectroscopic analysis of normal white matter in control group and white matter hyperintensities and normal-appearing white matter in the affected group was performed. Using MR spectroscopy software, the metabolite ratios were determined for each group and compared to one another. Analysis using Kruskal-Wallis H test was used to determine statistical significance.

RESULTS: In the normal group consisted of 16 subjects with a total of 149 white matter voxels analyzed, the average metabolite ratios (standard deviation) obtained are 2.19 (0.38), 1.30 (0.26), and 0.62 (0.11) for the NAA/Cr, Cho/Cr, and Cho/NAA, respectively. In the study group consisted of 15 subjects, 60 white matter hyperintense foci and 75 normal-appearing white matter voxels analysed, the average metabolite ratios obtained in white matter hyperintense foci are 1.83 (0.50), 1.48 (0.46), and 0.86 (0.37) for the NAA/Cr, Cho/Cr, and Cho/NAA, respectively. The average ratios of metabolites in the normal appearing white matter in the study group are as follows: NAA/Cr = 1.96 (0.28), Cho/Cr = 1.23 (0.27) and Cho/NAA = 0.64 (0.13). Based on the results of the Kruskal-Wallis equality of populations rank test, there is significant difference between the metabolite ratios obtained in normal group and normal-appearing white matter in study group in terms of their NAA/Cr and Cho/Cr ratios, and between the normal-appearing white matter and white matter hyperintensities in study group, in terms of their NAA/Cr, Cho/Cr ratios, and Cho/NAA ratios.

CONCLUSION: Multi-voxel spectroscopic analysis of leukoaraiosis showed significantly lower NAA/Cr ratio and higher Cho/Cr and Cho/NAA ratio compared to the normal group. This indicates presence of neuronal loss with increased cellular turnover in leukoaraiosis. The normal-appearing white matter in affected patients showed a lower NAA/Cr and lower Cho/Cr with no significant change in the Cho/NAA ratio. Although there may be some neuronal loss, the insult may not be sufficient to injure the white matter as indicated by concomitant low choline concentration. In summary, the white matter hyperintensities in leukoaraiosis have MR spectroscopic evidence of neuronal loss with increased membrane turnover which is also found in neoplastic conditions. However, the lack of NAA-choline peak reversal differentiates this condition from a neoplasm. Lack of lactate and lipid differentiates this condition from an outright infarction, infection, and necrotic brain tumours. It can also be concluded that although there is still no visible evidence of a white matter abnormality in the ipsilateral or contralateral side in patient affected with leukoaraiosis, metabolic alteration may already be present.
ASSOCIATION OF TOTAL ABDOMINAL ADIPOSE TISSUE AND PRESENCE OF GALLBLADDER STONES AMONG PATIENTS WITH COMPUTED TOMOGRAPHY OF THE WHOLE ABDOMEN
MARY GRACE A. AGGA, M.D., DPBR

ABSTRACT

Background: Obesity, defined as accumulation of excess fat in one’s body to the point that it presents a risk to health\(^2\), has been linked to the formation of cholecystolithiases. Several other diseases associated with obesity include metabolic syndrome, hyperinsulinemia\(^3\) and deranged lipid profile, all equally contributory to the formation of gallbladder lishiases. While obesity has been established as one of the many factors in the formation of gallbladder stones, the relationship of regional fat distribution with formation of cholecystolithiases is still controversial\(^4\).

Objective: The aim of this study is to investigate whether abdominal fat distribution is associated with cholecystolithiases using Computed Tomography. This study also investigates whether visceral fat is an independent risk factor in gallbladder stone formation.

Materials and Methods: This study used Computed Tomography to measure the total abdominal adipose tissue because it is an accurate tool that can identify and quantify the visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT), as well as measure the waist circumference (WC).

From the images obtained, a single axial image was taken at the level of the umbilicus with the L4-L5 clearance or intervertebral disc space as the reference point\(^5\). A standardized attenuation range was used and set at -190 to -30 HU in obtaining the total abdominal adipose tissue\(^6\).

The SAT is identified as region between the inner skin outline and the outer outline of abdominal muscle, while the VAT is recognized as the region within the outer outline of the abdominal muscles and anterior edge of the spinal vertebra, excluding the intra-abdominal structures such as bowels, vessels and lymph nodes\(^7\). The SAT and VAT were selected manually using the Region of Interest (ROI) tool (Siemens Syngo.Via Workstation) which measures both the mean Hounsfield unit as well as the computed area (cm\(^2\)) of the selected structures.

The total abdominal adipose tissue (TAT) was computed using the equation TAT = SAT + VAT\(^8\). The waist circumference was likewise obtained. All parameters were measured manually.

Cholecystolithiases is identified on computed tomography as dense or slightly calcified focus or as an area with a rim of increased density within the gallbladder lumen\(^9\).

Results: Results demonstrate that at 1% level of significance, SAT, VAT and TAT are significantly affecting the occurrence of cholecystolithiases and at 5% level of significance; WC is rendered significantly associated with the presence of gallbladder stone.

There are 109 subjects with increased VAT (~100 cm\(^2\) \(^9\)) and 125 subjects with normal VAT in this study. Upon comparison of the cholecystolithiases and non-cholecystolithiases group, the incidence of increased VAT in the cholecystolithiases group is higher than the non-cholecystolithiases group.

Although it has been concluded in several articles that the female gender is strongly associated with the formation of gallbladder stones, gender had no significance in this study.

Age is also established to be statistically significant in the cholecystolithiases group than in the non-cholecystolithiases group (P = 0.000) in this study. Although in varying degrees, it has been found that the SAT, VAT, TAT and WC are all significantly correlated with each other.

Conclusion: It is verified in this study that SAT, VAT, TAT and WC are related with the presence of cholecystolithiases. Age is confirmed to be associated with cholecystolithiases, while gender is not related. There is also increased incidence of increased VAT in the cholecystolithiases group when compared to the non-cholecystolithiases group. With varying degrees, all abdominal adipose tissue measurements are correlated with each other.

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\(^2\) http://www.who.int/topics/obesity/en/
\(^6\) Tohru Yoshizumi et al. Abdominal Fat: Standardized Technique for Measurement at CT. Radiology 1999; 211:283–286
\(^7\) Zhang Y, et al.
\(^8\) Zhang Y, et al.
RADIO-PATHOLOGIC ASSOCIATION OF BREAST LESIONS WITH BI-RADS 4 FINDINGS ON MAMMOGRAPHY TO ESTABLISH BI-RADS 4 SUBCATEGORIES IN THE MEDICAL CITY

Author: SHADEE DIANE B. ALIPIO\textsuperscript{1}, M. COREENA BUESER\textsuperscript{2}, KIMBERLY ANG-BALUYUT\textsuperscript{1}, ELIZABETH ANN S. ALCAZAREN\textsuperscript{2} AND SARAH JANE L. DATAY-LIM\textsuperscript{2}

\textsuperscript{1}Department of Radiology and \textsuperscript{2}Section of Anatomic Pathology, Department of Laboratories, The Medical City, Ortigas, Metro Manila, Philippines

ABSTRACT

A retrospective study was conducted to determine the clinical significance of BI-RADS 4 subcategories by assessing the radiopathologic association of all breast lesions designated as BI-RADS 4 on mammography results. Between January 2013 and July 2015, a total of 331 patients were classified as BIRADS 4. Of these, 171 underwent biopsy at our institution, resulting in a biopsy rate of 48.3%. They underwent examinations due to either screening (47%) or diagnostic (53%) purposes. Of the diagnostic mammograms, the most common indication for consult was palpable breast mass. Individuals had a mean age of 54.69 $\pm$ 10.79. There were 76 malignancies of the 135 biopsied lesions in the present study. Core needle biopsy was the preferred biopsy procedure. The most common type of malignancy was invasive ductal carcinoma. The most common benign pathologies included fibrocystic change. Presence of calcification and a hyperdense ill-defined mass together were highly associated with malignancy. The BI-RADS 4A patients were mostly malignant (57.61%). Benign findings were present in 38.98% of patients. BI-RADS 4B has a malignancy rate of 85.18% while BI-RADS 4C had a malignancy rate of 90.92%. The overall malignancy rate of BI-RADS 4 is 74.8%. The positive predictive values according to the subcategories of 4A, 4B and 4C were 54.24%, 70.37% and 68.18%. PPV for malignancy in subcategory 4C was comparable to previous studies. In subcategories 4B and 4C, the malignancy rate was higher than that in subcategory 4A.
INTER-OBSERVER COMPARISON ANALYSIS IN QUANTIFYING PLEURAL EFFUSION IN CT SCAN IMAGES USING THE AP QUARTILE AND MAXIMUM AP DEPTH CLASSIFICATION RULES IN THE PGH SETTING

Primary Investigator: MARIA CRISTINA O. ANG, MD
Adviser: JAROLD P. PAUIG, MD

ABSTRACT

There is currently no established system for uniformly quantifying pleural effusion on CT scans. A uniform way of reporting may improve communication and aid in identifying patients in need of intervention. Moy, et al (2013) found that anteroposterior (AP) quartile and maximum AP depth significantly improved interobserver variation. Convenience sampling of 165 patient CT scans in the PGH database for the year 2015 was done. These were evaluated by three residents in the 3rd-4th year levels before and after applying the two methods. Application of the methods resulted in minimal improvement of interobserver variability from \( \kappa = 0.602 \) to \( \kappa = 0.697 \) or 71% to 75%. 
ABSTRACT

Background
Bone metastases are seen up to 70% of all cancer (1). Different types of bone metastases vary in their metabolic activity and in the reaction they induce in the surrounding bone (2). Even though bone metastases are not necessarily a life-threatening component of cancer, their complications highly compromise the patients' quality of life. Complications of osseous metastases are referred to as skeletal-related events (SRE) and include pathologic fractures, spinal cord compression, and hypercalcemia leading to renal failure. Diagnostic imaging modalities have an important role in the prognostication, treatment planning, and follow-up monitoring of bone metastases.

Objectives
To compare the accuracy of bone scintigraphy, MRI and PET/CT in the diagnosis of bone metastasis.

Search methods
We searched the following electronic databases: PUBMED, MEDLINE, EMBASE, and The Cochrane Library

Selection criteria
All prospective or retrospective cross-sectional studies (the year of publication will range from 2010 to 2016) were included. All patients with breast cancer or prostate cancer and suspicious bone metastases; who underwent at least any two combination of the following imaging modalities: A. Bone scintigraphy (with SPECT or SPECT/CT). B. Whole body magnetic resonance imaging (1.5 TESLA), C. PET/CT using either FDG or NaF as radioactive tracer. The reference standard: 1. Histopathologic reports and / or 2. Follow-up clinical assessment will be used as the reference standard

Data collection and analysis
Data was analyzed separately from bone scintigraphy, MRI, and PET/CT for patient and per lesion data. Pooled estimates sensitivity, specificity and diagnostic odds ratio (DOR) with 95% confidence intervals (CI) were calculated. Summary of receiver operating characteristic (ROC) curves were generated.

Main results
Five studies were included in the analysis. Among patients with breast cancer on per-patient basis, the pooled sensitivities by using bone scan, whole body MRI and FDG PET/CT in detecting osseous metastases were 88.8% (95% CI 79.7 to 94.7), 80.6% (95% CI 58.0 to 94.6), and 86.5% (95% CI 77.6 to 92.8). Among patients with breast cancer on per-patient basis, the pooled specificities by using bone scan, whole body MRI and FDG PET/CT in detecting osseous metastases were 59.2% (95% CI 44.2 to 73.0), 14.3% (95% CI 2.0 to 42.8) and 96.3% (95% CI 89.4 to 99.2)

Among patients with prostate cancer on per-patient basis, the pooled sensitivities by using bone scan, whole body MRI, FDG PET/CT AND NaF PET/CT in detecting osseous metastases were 82.0% (95% CI 68.6 to 91.4), 76.5% (95% CI 50.1 to 93.2), 68.9% (95% CI 53.4 to 81.8), and 72.2% (95% CI 46.5 to 90.3),

Among patients with prostate cancer on per-patient basis, the pooled specificities by using bone scan, whole body MRI, FDG PET/CT AND NaF PET/CT in detecting osseous metastases were 82.0% (95% CI 68.6 to 91.4), 76.5% (95% CI 50.1 to 93.2), 68.9% (95% CI 53.4 to 81.8), and 72.2% (95% CI 46.5 to 90.3),

Among patients with prostate cancer on per-patient basis, the pooled specificities by using bone scan, whole body MRI, FDG PET/CT AND NaF PET/CT in detecting osseous metastases were 82.0% (95% CI 68.6 to 91.4), 76.5% (95% CI 50.1 to 93.2), 68.9% (95% CI 53.4 to 81.8), and 72.2% (95% CI 46.5 to 90.3)

Authors' conclusions
The authors concluded that bone scan can be used to help distinguish patients with diffuse osseous metastases from patients with no skeletal metastasis. However, for patients with breast and prostate cancer, whole body MRI and FDG PET/CT have a higher diagnostic value for detecting bone metastasis.

The authors recommended further studies with well-designed methodology are needed to evaluate the diagnostic accuracy of different hybrid imaging modalities for the detection of bone metastases from different types of primary tumor.
The study was done to validate the significance of using the RENAL nephrometry scoring system as a preoperative planning tool in assessing the ideal surgical technique for a given renal mass and to determine its potential to enable health care providers to predict tumor pathology. A total of 23 patients qualified in this study. Data were subjected to RENAL nephrometry scoring and was later correlated to the type of nephrectomy technique (partial or radical) and to its histopathologic diagnosis. The study shows a strong correlation of the scoring system to the type of surgical technique and to the tumor pathology. RENAL nephrometry scoring system is an objective parameter in the decision making process of the urologist in determining the type of surgical technique appropriate for a given patient.
ABSTRACT
This is a retrospective correlation study of 119 subjects with CT scan findings of cirrhosis. Average splenic and hepatic arterial diameters and ratios were obtained and correlated with each MELD category. Using Pearson’s correlation (r), there is no significant correlation between the splenic artery diameter, hepatic artery diameter and splenic/hepatic artery ratio and MELD scores. (Spearman’s R statistic = 0.056, p value = 0.452)

INTRODUCTION
The splenic and hepatic artery dimensions as well as the splenic/hepatic artery ratio have been found out to correlate well with cirrhosis-induced portal hypertension in the study of Dao-Bing, et al. It was cited in the study that a cut-off of 4 mm for the splenic artery and a splenic/hepatic artery ratio of 1.4 strongly correlate with the presence of portal hypertension. However, it was not stated whether there is a correlation between the vessel diameters and ratio with the progression of cirrhosis.

The “model for end stage liver disease” (MELD) score has been largely utilized for evaluation of cirrhosis and as part of pre-liver transplant work-up due to its more objective parameters than its predecessor, the Child-Pugh Score. The study’s main objective is to determine if there is a significant correlation between portal hypertension as evaluated by the splenic/hepatic artery ratio with the MELD Score.

METHODOLOGY
This is a retrospective correlational study that included all patients who met the inclusion criteria and underwent plain and contrast-enhanced CT scan of the whole or upper abdomen from January 1, 2010 to January 31, 2014 with available laboratory parameters needed to compute the MELD score. The internal diameter of the proper hepatic artery was measured within 1 cm from its origin. The internal diameter of the splenic artery was measured at 3 locations: within 1 cm from its origin, at the upper edge of the pancreas, and within 1 cm from the point where the splenic artery branches originate. The mean value was calculated and recorded as the internal diameter of the splenic artery. The S/P ratio was also calculated.

RESULTS AND CONCLUSION
Majority of the study population fall in the MELD scores 10 to 19 (47.89 %) and 0 to 9 (37.81 %) category. Average splenic artery diameters were as follows: 0.64 cm in the less than 9 category, 0.68 cm in the 10 to 19 category, 0.71 cm in the 20 to 29 categories and 0.69 cm in the 30 to 39 category.

Average hepatic artery diameters, were as follows: 0.74 cm in the less than 9 category, 0.70 cm in the 10 to 19 category, 0.75 cm in the 20 to 29 categories and 0.79 cm in the 30 to 39 category.

Average splenic/hepatic artery diameters were as follows: 0.76 in the less than 9 category, 1.02 in the 10 to 19 category, 1.07 in the 20 to 29 category and 0.83 in the 30 to 39 category.

Using Pearson’s correlation (r), there is no significant correlation between the splenic artery diameter, hepatic artery diameter and splenic/hepatic artery ratio and MELD scores. (Spearman’s R statistic = 0.056, p value = 0.452)
ABSTRACT

Background and Objectives: Subarachnoid hemorrhage (SAH) is commonly caused by spontaneous rupture of aneurysm by incidence; unfortunately clinical prognosis in general remains dismal across age groups despite prompt initiation of treatment. Published reports compared various grading methods, patterns of hemorrhage, and apparent location of the ruptured aneurysm with the clinical outcome as well as severity of the condition. The aim of this study is to determine the relationship of quantity of subarachnoid hemorrhage using Hijdra method and size of aneurysm confirmed by CT angiography (CTA); and to correlate the presumed location of aneurysm based on the predominant hemorrhagic pattern with the true location of aneurysm through CTA. Significant results may aid in treatment planning particularly neurosurgical interventions.

Patients, Materials and Methods: Forty-eight consecutive subjects fulfilling the criteria of subarachnoid hemorrhage by noncontrast CT scan and subsequently confirmed for the presence of aneurysm by CTA were analyzed retrospectively, using plain CT scan and CTA reconstructed images archived at the Department of Radiology, Jose R. Reyes Memorial Medical Center from September 2015 to June 2016. Arteriovenous malformations, cavernomas, tumors, infections, trauma, and negative aneurysm were excluded. CT procedures were performed from a 16-slice CT scanner (Hitachi Supria) with a noncontrast brain CT scan followed by CTA using the protocol set by the CT scan section. Image analysis was done on a computer workstation that contains an image viewer and software for reconstruction algorithms. Collected data on age, sex, Hijdra scores, presumed aneurysmal site based on predominant bleeding pattern, size of aneurysm and true location were recorded, tabulated and statistically analyzed.

Results: 48 consecutive subjects with both subarachnoid hemorrhage on plain CT scan and evidence of aneurysm on CTA were selected from September 2015 to June 2016 at a single tertiary hospital. Age range is 37 to 78 years, with an overall mean age 55.13 years. Mean Hijdra score of 12.29 (±7.09) was obtained. Size of aneurysm as measured on CTA images ranged from 1.3-17 mm in males (mean of 5.896 ±4.14 mm, p-value of 0.351), and 1.6-10.7 mm in females (mean 5.1 ±2.32 mm, p-value of 0.867), with and overall range of 1.3-17 mm (mean of 5.481 ±3.31 mm, p-value of 0.287). MCA aneurysms were the most common lesions (29.2%), followed by ACA aneurysms (25%) and PC aneurysms as a group (22.9%). MCA and ACoA lesions were correctly interpreted on plain CT scan images at 92.9% to 91.7%, respectively, whereas ACA and posterior circulation aneurysms were correctly interpreted at 40% and 81.8%, respectively. Overall percentage of correct interpretation of these lesions was 83.33%.

Conclusion: No significant statistical correlation exists between the total Hijdra score and size of aneurysm, hence scoring of hemorrhage on plain CT scan images could not adequately predict the true size measurements on CT angiography. There is however correlation or good predictability of the location of MCA and ACoA aneurysms based on visual hemorrhagic patterns, whereas fair to poor predictability of ACA, ICA, and posterior circulation aneurysms.
INTRODUCTION: The Philippines is at the center of the battle against breast cancer, according to the Department of Health having the highest incidence rate in Asia and among the top 10 countries with the most cases of breast cancer. The American Cancer Society guidelines for breast cancer screening still puts mammography as the mainstay of screening for clinically occult disease and screening for breast cancer with mammography has been shown to decrease mortality from breast cancer, beginning annual screening at age 45 and transitioning to screening every two years at age 55. In spite of all these new and updated recommendations, there is little data on the optimum age to start screening mammography in women at increased risk for breast cancer. This paper considers the mammographic profile of patients who have one or more first-degree relatives with breast cancer as well as the relationship of the findings to age of the patient.

METHOD: This is a retrospective, cross-sectional research study of 3,493 patients with first-degree relatives diagnosed with breast cancer, with no previous history of carcinoma, who submitted for Annual Screening Digital Mammography at Cardinal Santos Medical Center. With a projected inclusion criteria of 50% with a margin of error of 5%, a total of 495 participants were included and stratified according to age-group as follows: below 30 years, 30 to 39 years old, 40 to 49 years old, 50 to 59 years old, 60 to 69 years old and 70 years old and above. These groups were assessed on the basis of parenchymal patterns, calcifications, mass, asymmetry and postsurgical changes. The frequencies of mammography findings were determined and the corresponding proportions were computed for each of the identified age groups. Contingency coefficient was used as the test of correlation between the identified age groups and the mammography findings.

RESULT: Of the 495 subjects, majority were in the 40-49 years and 50-59 years age groups. There were 23 total mammographic findings with outright malignant features, 15 of which were calcifications with malignant features and 9 of which were masses with malignant appearance. Majority of the patients with microcalcifications with malignancy features are in the 40 to 49 years and 60-69 years age groups while majority of the malignant-appearing masses were also in the 40-49 years age groups. A total of 426 subject had findings of dense breasts (247 or 49.9%), calcifications suspicious for malignancy (15 or 3.0%), isodense masses (136 or 27.5%) and asymmetry (28 or 3.0%) that warranted additional diagnostic modalities such as ultrasonography or compression-magnification mammography.

Only the mammographic finding of asymmetry had a significant relationship to age of the patient which increases with age, particularly in the age brackets 40 to 49 up to 50 to 59 years.

CONCLUSION: It is concluded that, among patients with 1st degree relatives with breast cancer undergoing screening mammography, majority of the patients had dense breasts, benign calcifications, no masses, no asymmetry and no post-surgical change. However, a small number of patients had findings such as microcalcifications suspicious for malignancy as well as microcalcifications and masses highly suggestive of malignancy. Although these subjects represent a small percentage of the total population, it is important to note that majority of this findings were diagnosed in the 40-49 years age group. This affirms that early detection of possible breast malignancies is possible at these age groups with 1st-degree relatives diagnosed with breast cancer.

It is also concluded that only the incidence of asymmetry had some significant relationship to age.
A RETROSPECTIVE STUDY ON THE CORRELATION BETWEEN THE PRESENCE OF SIMPLE RENAL CYST WITH HYPERTENSION AND RENAL FUNCTION: UNIVERSITY OF SANTO TOMAS HOSPITAL EXPERIENCE

AILEEN C. LAM, MD, DPBR, ABIGAIL M. MILO, MD, FPCR, PEDRO DANILO J. LAGAMAYO, MD, FPCR

1Fellow-in-Training, Department of Radiological Sciences; 2,3 Consultant, Department of Radiological Sciences

University of Santo Tomas Hospital, España, Manila, Philippines
Email Address: aclam08@yahoo.com

ABSTRACT

Background of the Study and Objective: Simple renal cyst is one of the most commonly identified type of renal cyst. Due to the increasing use of medical imaging whether by ultrasonography, computed tomography or even magnetic resonance imaging as an investigative tool in abdominal pathologies, it has led to the frequent and incidental finding of renal cysts in the general population. The primary goal of the study is to determine the relationship between the presence of simple renal cysts found during contrast enhanced abdominal computed tomography examinations for evaluation of diseases other than the kidneys, with hypertension and the patients’ renal function.

Methodology: A retrospective study of hospitalized patients above 18 years in age that underwent contrast-enhanced abdominal computed tomography examination (with visualization of the entire kidney) from January 2011 to February 2016 at the University of Santo Tomas Hospital was undertaken. Selected patient demographic and clinical information as well as corresponding renal imaging findings were reviewed. Age range matching between the patient group (with simple renal cyst) and control group (without simple renal cyst) was done. Descriptive and analytic statistics were generated for all variables at 95% confidence interval.

Results: Simple renal cysts were found in 381 patients among 1,012 patients. The overall prevalence of simple renal cysts was 37.6% ranging from 0.80% in the 2nd decade of life to 27.5% in the 7th or later decade of life with no gender predilection. The majority of cysts were bilateral in distribution and solitary in number. The mean largest diameter of cyst in centimeters (cm) was 0.85 (± 0.91) for the right side and 0.92 (± 1.13) for the left side. The average renal length and width for both groups were almost the same. In this study, a significant difference was demonstrated in the recorded systolic and diastolic blood pressure between the patients with simple renal cyst and those without. The odds ratio of the prevalence of hypertension was also higher for those with simple renal cysts. Likewise, an increased incidence of hypertension was noted when renal cysts were bilateral, more than two in number and measures more than 1 cm in diameter. However, no significant difference was detected in the serum creatinine level and estimated glomerular filtration rate between the two groups.

Conclusion: The presence of simple renal cyst was related to hypertension but not to an abnormal serum creatinine level or estimated glomerular filtration rate. The incidence of finding a simple renal cyst is higher in the older population with almost equal distribution in both genders. The most frequent number of cyst found per kidney was solitary and the most common pattern of cyst distribution is bilateral.
DETERMINATION OF THE ACCURACY OF SONOGRAPHIC ESTIMATION OF FETAL WEIGHT AT TERM PREGNANCY IN COMPARISON WITH ACTUAL BIRTH WEIGHT AT THE DR. JOSE FABELLA MEMORIAL HOSPITAL FROM JANUARY 2013 TO DECEMBER 2015

NORRAINE ANNE T. MARQUEZ, MD, DPBR¹, ABIGAIL M. MILO, MD, DPBR²
¹Fellow-in-Training, Department of Radiological Sciences; ²Consultant, Department of Radiological Sciences
University of Santo Tomas Hospital, Espana, Manila
E-mail: rainydays_09@yahoo.com

ABSTRACT

Objective: The primary goal of the study was to determine the accuracy of sonographic fetal birth weight estimation using the Hadlock’s formula in singleton, term pregnancy with the actual neonatal birth weight as the reference standard. This study also aimed to determine if there is a significant difference between the sonographic estimated fetal weight obtained 7 weeks prior to delivery and the estimates obtained at 8-14 days prior to delivery.

Materials and Methods: This retrospective study was reviewed and approved by the institutional review board of the UST Hospital and the requirement for informed patient consent was waived. Data was collected retrospectively from a total of 11,680 antenatal ultrasound examinations that underwent sonographic fetal weight estimation at term (≥37 weeks of gestation) within 14 days of delivery from the period of January 2013 to December 2015 in the Ultrasound section of the Dr. Jose Fabela Memorial Hospital. A total of 387 patients with singleton, alive, uncomplicated pregnancies in cephalic presentation were included in the final study population after meeting the inclusion and exclusion criterion. Using the Hadlock’s formula, the estimated fetal weight and actual birth weight were compared. The data was analyzed in 2 groups: 7 days prior to delivery and 8-14 days prior to delivery. The paired T-test was used in analysis of the data collected using a 95% level of confidence. Data was encoded and tallied in SPSS version 10 for windows. Descriptive statistics were generated for all variables. For nominal data frequencies, percentages were computed. For numerical data, mean ± SD were generated. The Bland-Altman method was also used to assess the agreement between estimated and actual weights.

Results and Conclusion: The mean estimated fetal weight was 3,298.69 ±424.17 grams (range: 1,660-4,268 grams), while the mean actual neonatal birth weight was 3,120.00 ±420.45 grams (range: 1,580-4,470 grams). The mean absolute percentage error for sonographic estimated fetal weight estimations obtained 7 days prior to delivery was 11.6 ±9.3 (n = 274), while those estimates obtained 8-14 days prior to delivery had an absolute mean error of 9.6 ± 8.3 (n = 104). Sonographic estimation fetal weight using the Hadlock’s formula at the Dr. Jose Fabella Memorial Hospital showed significant difference from the actual neonatal birth weight. In more than half of the study population (73.7% of the estimates obtained 7 days prior to delivery and 57.7% of the estimates obtained 8-14 days prior to delivery), it was observed that there is a tendency for overestimation of the fetal weight in relation to the actual neonatal birth weight. It was also established that sonographic estimation of fetal weight when obtained 7 days prior to delivery was more accurate as compared to the estimates obtained within 8-14 days.

Keywords: estimated fetal weight; Hadlock’s formula; neonatal birth weight; ultrasound
SERUM CREATININE AS PREDICTOR OF RENAL ULTRASONOGRAPHIC FINDINGS AMONG PATIENT DIAGNOSED WITH DIABETES MELLITUS AT SAN PABLO COLLEGES MEDICAL CENTER FROM JANUARY 1, 2015 TO DECEMBER 31, 2015

HANNA LEE C. QUIDAYAN, MD, DPBR

ABSTRACT

Introduction: Diabetic nephropathy is a kidney disease that is a complication of diabetes. Approximately 30% of patients with diabetic nephropathy eventually progress to end-stage renal failure, and the rest usually die from cardiovascular disease before reaching end stage. In a developing country like the Philippines, examination of the kidney using renal ultrasound may be costly to some patients and may not be readily available in some parts of the country. This makes monitoring of the progression of renal disease difficult in certain situations. Thus, a study to predict renal ultrasonographic findings using serum creatinine level was conducted.

Methodology: An analytic-observational study using cross-sectional study design was used. Records of DM patients who underwent renal sonography from January 1, 2015 to December 31, 2015 were retrospectively reviewed to determine the relationship between serum creatinine level and renal sonographic findings. Results: There was a high, positive correlation between serum creatinine level of subjects and renal echogenicity, which was statistically significant (rs = 0.835, p=0.000). On the other hand, there was a slight, negative correlation between serum creatinine level of subjects and renal parenchymal thickness, which was statistically significant (rs = -0.164, p=0.020). No correlation between serum creatinine and renal size of subjects with diabetes as shown on Spearman’s order rank correlation (rs = -0.102, p=0.150) was noted in the study. Serum creatinine level of 1.95 g/dl had a 100% specificity and 74.0% sensitivity to predict renal echogenicity of Grade 1 and above. Serum creatinine level of 18.93 mg/dl had 100% specificity and 3.6% sensitivity to predict renal size of 8 cm and below. Serum creatinine level of 12.60 mg/dl had 100% specificity and 25% sensitivity to predict renal parenchymal thickness of 0.8 cm.

Conclusion: Serum creatinine correlates well with renal echogenicity and can be used to predict renal echogenicity of Grade 1 and above. Serum creatinine also had a very high specificity and moderate sensitivity (100% specificity ad 74% sensitivity) at 1.95 mg/dl level. Further investigation is recommended to provide more evidence on the relationship between serum creatinine level and renal echogenicity.

Keywords: diabetic nephropathy, serum creatinine and renal echogenicity
ABSTRACT

Introduction: The presence of deranged renal function tests without mechanical obstruction indicates a "renal parenchymal disease. The ultrasound grading system of renal parenchymal disease (RPD) is based on the kidney’s cortico-medullary differentiation and comparison of the renal parenchymal echogenicity with the liver or spleen. Although renal parenchymal disease is frequently seen and reported in ultrasound results, specific grading of renal parenchymal changes is rarely used and only few studies were conducted regarding its relationship with renal function. Establishment of a correlation between renal parenchymal disease and glomerular filtration rate may warrant the use of the ultrasound grading system in the assessment of renal function and may provide an early prognostication of renal disease.

Objectives: The primary objective of this study is to determine the relationship between sonographic renal parenchymal changes and glomerular filtration rate measured through technetium-\(^{99}\)m diethylenetriamine pentaacetic acid (DTPA). Secondary objectives include: 1) To correlate renal echogenicity per grade with other parameters, specifically renal length, width and cortical thickness. 2) To determine the association of glomerular filtration rate with renal length, width and cortical thickness.

Methodology: This is a four-year retrospective study of 61 subjects (mean age 53 y/o) who had renal ultrasound and Tc\(^{99}\)m DTPA at a single tertiary hospital from the year from 2011 to 2014. Ultrasound grading of renal parenchymal changes was done by a single radiologist, who was unaware of the GFR results. Data gathering and comparative analysis was conducted for establishment and interpretation of results.

Results: Differences in mean GFR across RPD grades are not statistically significant for both kidneys, however an inverse relationship exists between glomerular filtration rate and renal parenchymal disease such that a decrease in GFR shows higher grade of RPD. Glomerular filtration rate was found to have positive linear correlation with renal length, width and cortical thickness. No relationship exists between renal parenchymal disease and renal size.

Conclusion: Ultrasound grading of renal parenchymal disease may improve the evaluation and prompt diagnosis of the renal disease.
ABSTRACT

Purpose: Identifying the presence and degree of liver fibrosis is important in initiating treatment. However, the gold standard is still biopsy, which is rather invasive and also prone to sampling error. This study aims to correlate non-invasive serum biomarkers for liver fibrosis with shear wave elastography, which measures liver stiffness using ultrasound technology.

Material and Methods: Data from patients who underwent ultrasound liver elastography from May 2013 to February 2016 were used. These were then correlated with serum biomarkers for liver fibrosis particularly AST, ALT, Alkaline phosphatase, platelet count, and APRI score.

Results: There is a weak positive correlation with liver stiffness and AST, ALT, alkaline phosphatase, and APRI score. An inverse weak correlation between liver stiffness and platelet count was observed. Among the parameters used, liver stiffness by elastography correlated best with the APRI score ($r = 0.3389$ $p= 0.0000$).

Conclusions: The correlation between liver stiffness by elastography and serum biomarkers was weak. This may be because the study did not consider the etiology of the suspected or identified liver disease. Further study using subsets of population with a particular liver disease may have a better outcome.
INCLUSION OF THE IPSILATERAL SUBVENTRICULAR ZONE (SVZ) IN THE IRRADIATED FIELD FOR GLIOBLASTOMA MULTIFORME (GBM): A PRELIMINARY STUDY

DIANA P. TUANO-ESTRELLAS, M.D., R. RAMOS, M.D., R. BACLAY, M.D., M. CALAGUAS, M.D., R. TORCUATOR, M.D.

(St. Luke’s Medical Center, Quezon City)

Purpose/Objectives: The neural stem cells of the SVZ of the brain are capable of postnatal neurogenesis. GBM tumors also possess these stem cells, which may be derived from the SVZ. GBM confers a poor prognosis due to the possible reason that therapies fail to eradicate the resistant stem cells in the SVZ.

Results vary from studies that investigate irradiation of the SVZ. It was the aim of this study to determine if higher radiation doses to the ipsilateral SVZ and if the volume of the ipsilateral SVZ receiving 58 Gy figure in the improvement of the progression free survival (PFS) and overall survival (OS) of GBM patients to conclude if the ipsilateral SVZ should be consequently included in the irradiated field for GBM patients.

Materials and Methods: This retrospective, cohort study began with data review of previously treated GBM patients in a single institution. The ipsilateral and contralateral subventricular zones were contoured on CT planning scans. The mean doses were determined and statistically analyzed.

Results: A total of 15 patients were deemed eligible for preliminary data analysis. For ipsilateral SVZ dose, the mean dose (SD) for patients who were deceased at the time of analysis was 58.55 Gy (SD=9.67) while the mean dose (SD) for patients who were alive was 59.5 (SD=4.04). (p=0.792).

The overall 5-year survival estimate rate for patients whose ipsilateral SVZ received ≤58 Gy and > 58 Gy is 33% and 22% respectively. The overall survival rate of 67% was observed at 6 months for patients who received SVZ dose ≤ 58 Gy and the same percentage at 12 months for patients who received SVZ dose > 58 Gy (p=0.65). The median survival time for > 58 Gy group was 13 months while the median survival time for ≤58 Gy group was 6 months (p=1.00).

The 5-year progression-free survival estimate rate for patients who received ≤58 Gy and > 58 Gy was 33% and 22% respectively. At 13 months, the progression free survival rate for ≤58 Gy group was 33% while the same survival rate was observed in > 58 Gy group at 24 months (p=0.78). The median survival time for ≤58 Gy and > 58 Gy are 7.5 and 7, respectively (p=0.57).

Conclusion: A conclusion to include the ipsilateral SVZ during GBM irradiation cannot yet be made due to the preliminary study’s small sample size. A trend towards more patients whose ipsilateral SVZs were irradiated with lower doses and had mean doses specifically lower than 58 Gy succumbing to death earlier was seen and will be further investigated.
ABSTRACT

Introduction: There has been an increasing use of fluoroscopy-guided invasive procedures and it has become essential to contemporary practice of medicine. Increasing complexity of some of these procedures, however, requires increased exposure to radiation and carries risk for stochastic (e.g. cancer) and deterministic (e.g. skin injuries) effects. The probability of occurrence of stochastic effects increases with increasing dose but whose severity is independent of total dose. On the other hand, deterministic effects are characterized by threshold doses below which the effect is not observed, but increases in severity with increasing radiation dose above the threshold level. This study aims to present data on radiation doses in patients undergoing diagnostic and interventional radiology procedures done by the consultants and fellows-in-training of the Section of Vascular and Interventional Radiology and identify procedures associated high patient radiation doses. The conventional threshold for radiation-induced skin injury is > 2 Gy. A cumulative dose (CD) of 5 Gy (which usually yields a peak skin dose of 3 Gy) was used as the substantial radiation dose level (SRDL) as recommended by the Society of Interventional Radiology and the Cardiovascular and Interventional Society of Europe and the National Council on Radiation Protection and Measurement (NCRP).

Methodology: All adult patients (19 years old and above) who underwent diagnostic or interventional radiology procedures from 07 July 2011 to 31 December 2014 using Philips Allura CV20 fluoroscopic equipment were included in this study. Patient radiation dose values, displayed in the fluoroscopic machine console monitor, are recorded in logbooks. The patient radiation dose data included in this study are: (1) dose-area product (DAP), which is a surrogate measurement for the entire amount of energy delivered to the patient by the beam, and (2) cumulative dose (CD).

Results: A total of 771 cases of diagnostic and interventional fluoroscopically guided procedures were included in this study. There were 371 males and 400 females with ages ranging from 19 to 88 years old and an average age of 46.2 years. More than half of the cases (498) were cerebral angiograms, followed by hepatic transarterial chemoembolization (73), percutaneous transhepatic biliary drainage (70), and other head and neck embolization procedures (30). Most embolization procedures, as well spinal angiograms, recorded high DAP values. There were 19 instances wherein CD exceeded 5 Gy: 40% (12 out of 30 cases) of other head and neck embolization, followed by 56% (5 out of 9 cases) of CCF embolization using coils, 25% (1 out of 4 cases) of coil embolization of intracranial aneurysm, 0.17% (2 out of 12 cases) of visceral embolization, 0.09% (1 out of 11 cases) of visceral angiography, and 0.01% (1 out of 73 cases) of hepatic transarterial chemoembolization (TACE). The highest CD recorded was 11.1 Gy from a head and neck embolization procedure, followed by 10.2 Gy from a coil embolization of carotid-cavernous fistula (CCF).

Conclusion: Most embolization procedures are associated with high radiation doses. Radiation doses exceeding 5 Gy, which is the substantial radiation dose level, do occur in some of the procedures performed in this institution. These potentially high risk procedures include coil embolization of carotid-cavernous fistula and intracranial aneurysm, other head and neck embolization procedures, and visceral embolization.
This is the case of KV, a 10 year old male, known to have multiple deformities since birth, which came in due to a sensation of “fish bone lodged in his throat”. On physical examination, the patient was noted to have a mass on the right supraorbital area, numerous hard nodules on the occipital and parietal area, long thin limbs with leg length discrepancy of the lower extremities and a cerebriform nevus on the sole of his left foot (Figure 1). The patient likewise presented with multiple pigmented patches in the left side of the trunk and left arm. Upon consult at our institution, tonsillar hypertrophy was noted. Further work-up was done for the patient.

Initially, a skeletal survey was requested for the patient who showed the osseous structures. The skull showed multiple bony protuberances in the calvarium, mostly along the parietal and occipital regions. There were no lytic or blastic lesions noted. Radiograph of the cervical, thoracic and lumbar spine showed leftward deviation of the cervical spine and rightward deviation of the thoracolumbar spine. The left humerus, radius and ulna are slightly longer than their counterparts on the right (Figure 2). The carpals are metacarpals and collections of fine soft the distal ends of the The left femur, tibia and counterparts on the right towards the medial side. fossa on the left knee. The right knee is well-delineated. The left longer than the right the left foot.

A systemic condition was considered which may be metabolic or hematologic in nature. Clinical and laboratory examinations were recommended. The patient underwent biopsy of the pigmented patches on the left side of his trunk and cerebriform lesion on the sole of his left foot. Histopathologic findings revealed epidermal nevus and connective tissue nevus, respectively. The patient then underwent ultrasound of both lower extremities which revealed no sonographic evidence of soft tissue mass or vascular malformation on color Doppler interrogation.
CT scan of the chest was done revealing subcentimeter pulmonary nodule on the right lower lobe; subsegmental atelectasis in the lingula, small air cyst in the left lower lobe and persistent left superior vena cava. Whole abdominal CT scan showed abundance of mesenteric fat and focal prominence of subcutaneous fat in the left upper and anterior abdominal wall which relate to lipomatous overgrowth. Dilated portal venous system including its tributaries in the pelvic region were also identified. Nodular densities with phleboliths are also noted in the regions anterosuperior to the urinary bladder, space between the right gluteus maximus and medius muscles, and probably in the left scrotal sac. The findings are suggestive of presence of vascular anomalies, probably venous malformations. The patient’s liver was also noted to be predominantly left-sided.

Given our pediatric case and the relevant imaging findings, Proteus Syndrome was considered. Applying the categories and manifestations from the study of Biesecker (Table 1, European Journal of Human Genetics, 2006), the patient was able to satisfy the different categories to be diagnosed as a case of Proteus Syndrome. The lesions in the patient are mosaic, progressive and sporadic. KV satisfied category A, having a cerebriform connective tissue nevus in the sole of his left foot. In category B, the patient satisfied both requirements of epidermal nevus and disproportionate overgrowth. In category C, the patient was able to satisfy the dysregulated adipose tissue (abundance of mesenteric fat and focal prominence of subcutaneous fat in the left upper anterior abdominal wall). The findings of dilated venous system and pelvic phleboliths suggesting presence of vascular anomalies which are probably venous suggest a possible venous malformation. This particular finding can further be investigated on follow-up. A cyst was also noted in the left lung.

Proteus Syndrome is a disease that causes tissue overgrowth in a mosaic pattern that may affect tissues from any of the three germinal layers. This disease has varied manifestations such as asymmetric macrocephaly, vertebral anomalies, overgrowth of long bones, hyperostosis, partial gigantism of hands and feet, limb asymmetry, connective-tissue nevi, lipomas and vascular malformations. It is known for its mosaic distribution in the body. In infancy, patients who are affected by this disease may initially appear normal but eventually progressively developed the features of the disease. Joseph Merrick, known as the Elephant Man was the first reported case of Proteus syndrome. As reported, there have only been a few hundreds who have been affected by this rare, one in a million diseases.

Proteus Syndrome is caused by mutation in the AKT1 gene which randomly affects one cell during development before birth. As cells divide, some will have the mutation and some will not resulting in mosaicism, thus causing causes abnormal growth.

The differential diagnoses for this case include the following: Klippel-Trenaunay syndrome, Neurofibromatosis Type I and Hemihyperplasia-Multiple Lipomatosis Syndrome.

In summary, this is a case of a 10 year old male who presented with asymmetric disproportionate overgrowth. Correlation with history, physical examination findings, diagnostic criteria, biopsy and the use of varied imaging modalities allowed us diagnose this case properly.
### Table 1 Revised PS diagnostic criteria.

**To make a diagnosis of PS, one must have all the general criteria, and various specific criteria.**

**General Criteria**
- Mosaic distribution of lesions
- Sporadic occurrence
- Progressive course

**Specific Criteria categories**

<table>
<thead>
<tr>
<th>Specific criteria categories</th>
<th>Specific criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 1. Cerebriform connective tissue nevus*</td>
<td>B. 1. Linear epidermal nevus</td>
</tr>
<tr>
<td>2. Asymmetric, disproportionate overgrowth*</td>
<td>One or more:</td>
</tr>
<tr>
<td>(a) Limbs</td>
<td>(b) Hyperostosis of the skull</td>
</tr>
<tr>
<td>(c) Hyperostosis of the external auditory canal</td>
<td>(d) Megaspondylodysplasia</td>
</tr>
<tr>
<td>(e) Viscera:</td>
<td>(f) Spleen/thymus</td>
</tr>
<tr>
<td>3. Specific tumors before 2nd decade</td>
<td>One of the following:</td>
</tr>
<tr>
<td>(a) Bilateral ovarian cystadenoma</td>
<td>(b) Parotid monomorphic adenoma</td>
</tr>
</tbody>
</table>

**Specific Criteria**
- Either: |
| Category A or, | Two from category B or, |
| Three from category C |

1. Dysregulated adipose tissue
   - Either one: |
   (a) Lipomas |
   (b) Regional lipohypoplasia |
2. Vascular malformations
   - One or more: |
   (a) Capillary malformation |
   (b) Venous malformation |
   (c) Lymphatic malformation |
3. Lung cysts
4. Facial phenotype
   - All: |
   (a) Dolichocephaly |
   (b) Long face |
   (c) Down slanting palpebral fissures and/or minor ptosis |
   (d) Low nasal bridge |
   (e) Wide or anteverted nares |
   (f) Open mouth at rest

This table is adapted from prior publications.⁶,⁸,¹⁶

*Cerebriform connective tissue nevi are skin lesions characterized by deep grooves and gyrations as seen on the surface of the brain. See text and Figure 1 for details.

*Asymmetric, disproportionate overgrowth should be carefully distinguished from asymmetric, proportionate, or ballooning overgrowth. See text and Figure 1 for details.

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PRIMARY ADRENAL HEMANGIOPERICYTOMA


ABSTRACT

Hemangiopericytoma (HPC) is a distinct neoplasm of pericytic origin, which represents only about 1% of all soft tissue tumors. It is atypical in adult life and may appear anywhere in the body. This is a case of a thirty-two year old, female, from Bislig City, Surigao Del Sur, with primary adrenal hemangiopericytoma, confirmed by Fluorescence In Situ Hybridization (FISH) test. Extensive web search reveals no published literature for primary adrenal hemangiopericytoma. This may be the first reported case worldwide.

The patient had a 5-year history of gradually enlarging right abdominal mass, associated with changes in bowel habit and recurrent abdominal pain, temporarily relieved by analgesic. Contrast CT scan of the whole abdomen revealed a well-defined, calcified, ovoid, right suprarenal mass with pre-contrast attenuation value of +28 HU, measuring 18.5 x 16.8 x 16.3 cm (LWT). Adrenal mass CT protocol showed a heterogeneous peripheral centripetal enhancement in the arterial phase (+92 HU), which slowly diminished over time to +72 HU in the venous phase and +62 HU in the delayed phase with absolute contrast washout of 14%, findings suggestive of primary adrenal malignancy. She underwent uneventful right adrenalectomy with en-bloc nephrectomy and no recurrence on CT scan follow-up nine months after surgery.

INTRODUCTION

Hemangiopericytoma (HPC) is a rare malignant vascular tumor that originates from pericytes of Zimmerman. Pericytes cells with finger-like extensions, wrap around endothelial cells that line the lumen of capillaries and post-capillary venules. Exact function of these cells is unknown but believed to play a significant role in regulating diameter of blood vessel lumen by contractile properties. Since pericytes are widely distributed throughout the body, reported cases of HPC may be found in different areas. Most common location is soft tissue of extremities, particularly the thigh with 34.9% reported cases. Second most frequent site is from retroperitoneum and pelvic cavity (about 25%). Little has been published about hemangiopericytoma involving other organs. In 2002, a case of meningeal hemangiopericytoma with metastasis to the adrenal gland was reported. In world literature as of 2009, 41 reported cases of renal hemangiopericytoma were cited. None of these reported cases were known to arise primarily from adrenal glands.

Hemangiopericytoma at the time of diagnosis is often large due to its slow growth rate and non-specific clinical presentation. By the time it is even diagnosed, it may have metastasized, primarily to lungs, liver and bones via hematogenous dissemination and rarely, via lymphatics. The usual cause of death is metastasis. Hence, timely recognition is a must for better prognosis.
Precise diagnosis of hemangiopericytoma can be achieved only by histopathologic special staining procedures.

CASE SUMMARY

S. N. is a thirty-two-year-old female, who had a history of a slow-growing right flank mass, which she tolerated over 5 years.

Two years prior to consultation, she complained of right-sided abdominal pain with 4/10 pain scale intensity and accompanying numbness on the right lower extremity. Sonographic study at a local hospital showed retroperitoneal mass in the right. She was advised further diagnostic exams, which she did not comply. She went home with prescribed analgesic, which offered temporary relief of pain.

Seven months prior to consultation, there was marked increased in the size of the mass in the right, associated with feeling of heaviness, early satiety and shortness of breath. The patient sought medical consult and was referred to this institution, CT scan of the whole abdomen with adrenal protocol showed a large, well-defined, calcified, ovoid, mass in the right suprarenal space. This measured 19.4 x 18.4 x 15.6cm (LWT). The mass showed a heterogeneous, peripheral centripetal enhancement in the arterial phase with +92 HU (see Figure 1B), which slowly diminished over time to +72 HU (see Figure 1C) in the venous phase and +62 HU (see Figure 1D) in the delayed phase with absolute contrast washout of 14% (see Figure 1D). The mass compressed and displaced the inferior vena cava, pancreas and small intestines to the left; the liver superiorly and the right kidney inferiorly. The primary imaging consideration was primary adrenal malignancy with inferior vena cava compression.

Exploratory laparotomy revealed a huge mass originating from the right adrenal gland, most is adherent to the ipsilateral kidney and inferior vena cava. She underwent radical adrenalectomy with en-bloc nephrectomy via trans-abdominal approach. Venorrhaphy was also performed, requiring transfusion of six units of Packed Red Blood Cells (PRBC) in the process due to blood loss. Microscopically, the tumor revealed sheets of atypical pericytes with numerous thin-walled ramifying vessels forming a “staghorn” configuration, some of which are dilated. These atypical cells are relatively uniform in size with round to ovoid angulated hyperchromatic nuclei, a moderately basophilic cytoplasm and ill-defined borders (see Figure 4). Histopathologic picture is compatible with hemangiopericytoma. Sections from kidney, blood vessel and ureter were all unremarkable. Fluorescence In Situ Hybridization (FISH) revealed 20 out of 50 informative cells (40%, cut off: 1.5%) have a translocation of chromosome 12 and chromosome 19. This is confirmatory for primary adrenal hemangiopericytoma.

The patient was discharged after two weeks and advised long-term follow-up because of possible recurrence or metastasis. Follow-up CT scans of cranial, chest and whole abdomen nine months after surgery were unremarkable.
Figure 1. Adrenal Mass (M) Axial CT Scan. (A) Pre-contrast Phase (HU +28) with a well-defined, calcified, ovoid, right suprarenal mass. (B) Arterial Phase (HU +92) with heterogeneous, peripheral centripetal enhancement. (C) Venous Phase (HU +72). (D) Delayed Phase with absolute contrast washout of 14%.

Figure 4. Hematoxy-Eosin Staining. (A) Normal pericytes (thin black arrow) and (B) Atypical pericytes with thin-walled ramifying vessels (thick black arrow).
DISCUSSION

The management for adrenal tumor with no biochemical evidence of hormone excess and lesion more than 5 centimeters is surgical resection. Pathologic assessment is done for definitive diagnosis. In the case of the patient, she underwent right adrenalectomy with en-bloc nephrectomy. Histopathologic report was consistent with hemangiopericytoma.

Hemangiopericytoma (HPC) is a mesenchymal-derived vascular tumor with pericytic differentiation. Mesenchyme is the middle layer of the 3 primary germ layers of an embryo, namely the ectoderm, mesoderm and endoderm. The mesoderm gives rise to mesenchymal tissue, which is the source of bone, muscle, connective tissue and dermis of the skin. HPC is composed of fibroblasts and related cell types such as the pericytes, responsible for the contractile power of blood vessel lumen. Its most common locations are limbs, pelvis, head and neck and mostly muscle tissues, where mesenchymal cells are present. The tumor arises in the affected organ as a mass due to excessive layering of sheets of pericytes around improperly formed vessel.

HPC is atypical tumor in adult life, median age at diagnosis is 45 years old, uncommon in children and distribution is equal in both sexes or slight difference in male and female patients, with the predominance of females.\(^1\),\(^2\)

Clinical features are non-specific and currently no pathognomonic sign has been attributed to it. HPC usually presents as painless abdominal tumor in 66% of cases with varying sizes, ranging from 1 to 20 centimeters and gradually enlarges, causing pressure effect on the adjacent structures.\(^10\)

Diagnostic imaging is non-specific despite technical advances. Pathologic assessment is the sole means of HPC diagnosis. Cytogenetic analysis using Fluorescence In Situ Hybridization (FISH) was done, which is the confirmatory for the diagnosis of HPC. Wide surgical resection remains the mainstay of treatment.\(^2\) Radiotherapy and chemotherapy are adjuvant therapies for unresectable and metastatic cases.\(^25\) HPC has a unique variable way of malignant potential. According to the study of Espat, et.al, those patients undergoing complete resection showed a 100% survival rate at five years. In general, prognosis of HPC is worse in the adult type. Local recurrence or metastasis can come about even decades later, commonly by hematogenous and to a lesser extent by lymphatic route. Long term periodic CT scans are necessary, even after complete surgical removal of the tumor.\(^26\) According to Ferrari, A. et al, patient follow-up as of 2001, may be done as early as 24 months.

CONCLUSION

Pathologic assessment is the sole means of HPC diagnosis and confirmed by Fluorescence in situ Hybridization (FISH). This disease should never be managed without proper imaging. Diagnostic imaging plays an imperative role in the meticulous surgical planning. CT scan is the most suitable method for assessment of the size and extent of the mass, its morphologic features and vascular encasement. Surgery is the mainstay of treatment. Clinicians must also be aware that long-term follow-up monitoring is mandatory even after radical resection. The most common organs for metastases are chest, liver and bone. Timely recognition of recurrence is a must for excellent prognostication.

REFERENCES

This is a case of a 31 year old female from Davao City who presented with dysmenorrhea, foul-smelling discharges, febrile episodes and infertility for a year (2014- August 2015). Patient consulted an OB-GYN due to persistence of the symptoms. Past medical history was unremarkable. The family history showed hypertension and diabetes mellitus on the paternal side. Patient’s menarche was at 12 years old with a regular 28 to 30 day cycle lasting for 5-7 days per menstrual period. She is nulligravid with no history of contraceptive use.

Pertinent physical exam findings were a palpable mass on the right lower quadrant area, a cystic mass in the right anterolateral vaginal wall on speculum exam. Bimanual examination revealed a closed cervix, effaced and deviated to the left. A non-tender, fluctuant vaginal mass was palpated which extended to the right lower quadrant of the abdomen. Pertinent laboratory findings showed leukocytosis with predominance of neutrophils.

Pelvic inflammatory disease (PID) is one of the differential diagnosis due to fever episodes, foul-smelling vaginal discharges and leukocytosis. According to the 2010 CDC STD treatment guidelines the diagnosis is made based on the symptoms, gynecologic examination and laboratory documentation of cervical infection. The most specific criteria for the diagnosis include endometrial biopsy, transvaginal sonography or MRI, or laparoscopy \[4\]. Hence, the possibility of PID cannot be ruled out.

Bartholin gland cyst or Gartner duct cyst were also considered due to the presence of a cystic mass in the right anterolateral vaginal wall on speculum exam. Bartholin gland cysts are round and unilocular are typically seen at the posterior aspect of the vagina \[8\]. Hence, this diagnosis may be ruled out. Gartner duct cysts can be a consideration because these are usually seen in the anterolateral wall of the proximal portion of the vagina \[11\].

The patient underwent transvaginal sonography (TVS) for further evaluation. Since it is the modality of choice for patients with suspected pelvic inflammatory disease \[9\]. Fluid-filled sausage-shaped cystic structures in the adnexa are characteristic of PID on TVS. However, the patient’s TVS findings were not compatible with pelvic inflammatory disease. Instead, it showed two uterine bodies each with a cervix (Figure 1). The right cervix continued to a blind-ended vaginal dilatation. A 5.5 x 5.5 x 4.0 cm cystic vaginal mass was seen inferior to the right cervix (Figure 2).
Further investigation of the patient’s condition was done. MRI of the pelvis was performed and confirmed the presence of two cervixes continued to patent vaginal canal. No uterine corpora with one fallopian tube and appreciable fistula or communicating channel cervix, each. The cervix was separated by a septum measuring 0.8 cm. The right hemi-cervix continued to a blind ended vaginal posterior to the right hemiuterus which are dilatation. The dilatation is fluid filled seen as probably endometriotic implants.
Ultrasound of the kidneys, ureters and urinary bladder (KUB) was likewise done which revealed an empty right renal fossa. The left kidney, left proximal ureter and urinary bladder were normal.

The imaging findings showed a triad of uterine anomaly, obstructed hemivagina and ipsilateral renal anomaly (OHVIRA), by abbreviation, or Herlyn-Werner-Wunderlich syndrome (HWW). This rare congenital anomaly constitutes 0.16% - 10% of all Müllerian duct abnormalities [5]. Müllerian duct anomalies begin during embryogenesis. Embryologically, the internal genital organs and lower urinary tract are derived from the wolffian and mullerian ducts. In females, the müllerian ducts fuse at the midline forming the uterovaginal canal, from which the fallopian tubes, uterus and upper two-thirds of the vagina develop. Embryologic arrest during the 8th or 9th week of gestation results to incomplete fusion of the müllerian ducts leading to two hemiuteri and hemicervices. This explains the patient’s uterine didelphys configuration.

Müllerian duct anomalies are usually associated with renal anomalies. The kidneys develop when the ureteric bud extends from the Wolffian duct forming the metanephric mesenchyme[2].

Early failure of this development results in agenesis of the ureteric bud leading to an absent ipsilateral kidney and ureter [1].

Imaging modalities are important in the identification and diagnosis of Müllerian duct abnormalities. Ultrasound is initially done to evaluate gynecologic problems and is widely available. The presence of two endometrial cavities each with a uterine cervix [13] confirms the diagnosis of uterine didelphys and is classified as type III in the müllerian anomaly classification by the
American Society for Reproductive Medicine [6]. Magnetic resonance imaging (MRI) is best for the evaluation of müllerian duct anomalies [3]. It has the ability to provide multiplanar images and shows excellent soft tissue characterization. MRI of the pelvis can demonstrate the anatomic detail of the uterus and its surrounding structures. In the patient’s case MRI was able to show two separate uterine bodies, each with cervixes (uterine didelphys). In addition, the vaginal mass noted on physical examination was in fact an obstructed hemivagina due to the vaginal septum.

Laparoscopy remains the gold standard diagnostic modality with the additional advantages of therapeutic drainage of hematocolpos, vaginal septectomy, and marsupialization [7, 10]. The patient underwent a laparoscopy, diagnostic hysteroscopy, chromotubation and excision of the vagina septum. Brownish purulent foul-smelling fluid (100ml) was drained from the cystic mass in the vaginal wall. Cystureterscopy showed the left ureteral orifice was appreciated with efflux of urine while the right was absent, confirming the right renal and ureteral agenesis.

The symptoms of OHVIRA or HWW syndrome often presents with acute or chronic pelvic pain after menarche. Patients have a normal menstrual cycle and may show non-specific symptoms. If treatment is delayed, complications may develop, such as endometriosis caused by retrograde menstruation, infections, pelvic adhesion and infertility. The patient in this case was noted to have endometriotic implants on MRI and laparoscopy. Adhesiolysis was performed intraoperatively since a portion of the omentum was seen adherent to the right uterus.

Although in most cases uterine didelphys has a more favorable pregnancy outcome compared to other mullerian malformations there is still an increased risk of spontaneous abortion, fetal growth retardation and prematurity compared to patients with normal uterine anatomy [12].

In conclusion, Herlyn-Werner-Wünderlich syndrome (HWW) presents with nonspecific symptoms. It is rarely thought of as a differential diagnosis, especially in post pubertal patients. Thorough physical examination with high index of suspicion and diagnostic imaging are vital to the detection of HWW syndrome. The importance of imaging especially magnetic resonance imaging (MRI) is that it is able to demonstrate the müllerian anomaly without the anxiety of radiation exposure for the patients. This will enable the physician to diagnose and treat patients in order to prevent untoward complications.

The patient in this case had a final diagnosis of Herlyn-Werner-Wünderlich syndrome (uterine didelphys, obstructed right hemivagina, and right renal agenesis), Pyometra and Pelvic Endometriosis. She reported regular menses one month after the surgery. Follow-up with the attending physician after four months due to amenorrhea revealed a positive pregnancy test. A transvaginal ultrasound confirmed an intrauterine pregnancy with good cardiac activity on the left uterus.
REFERENCES:


MYCOTIC PULMONARY ARTERY ANEURYSM
Denver Sapo, MD (Philippine Heart Center)

ABSTRACT
A 66-year-old female presented with chest pain radiating to the back. CT aortogram showed aortic aneurysm and dissection. The patient underwent emergency aneurysm repair. Histopathologic studies of aortic tissue revealed cystic medial degeneration, dissection, and chronic granulomatous inflammation. Further laboratory investigations were attempted to narrow down the differential diagnoses of chronic granulomatous inflammation, however, there was not enough sample. Other causes like Takayasu arteritis and Giant cell arteritis were ruled out based on clinical findings. The patient does not have exposure or history of treatment to tuberculosis. Sputum AFB was negative but TB Quantiferon was positive indicating exposure.

She was then started on TB medications. Based on the clinical, laboratory, and imaging findings, the most probable cause of the aortic aneurysm and dissection was aortitis from chronic granulomatous inflammation, possibly tuberculous. In this presumptive case of TB aortitis, finding of aortic dissection is rare.

WYBURN MASON SYNDROME
Dennis Raymond L. Sacdalan, MD (Philippine General Hospital)

Abstract
The investigator reports a 26-year-old female with a history of a progressive chiasmal syndrome since birth, and after apt investigation was discovered to have intracranial and extracranial arteriovenous malformations (AVM) involving the right orbital region, right middle cranial fossa, posterior third ventricle, interthalamic, and right paramedian thalamic region, and right anterior paramedian parietal scalp area associated with the rare condition, Bonnet-Dechaumme-Blanc syndrome also known as Wyburn-Mason syndrome.

The current understanding, based on published medical journals, of this disorder focus on retinal lesions with little discussion on the importance of neuroradiological examinations in diagnosing and treatment planning. This report will thus focus on the direct importance of neuroradiological examination as well as the typical neuroradiologic presentation of this disease.
MIXED MULLERIAN, UROGENITAL AND GASTROINTESTINAL DEVELOPMENTAL ANOMALIES
Rosalie Jimenez-Hismaña, MD (Corazon Locsin Montelibano Memorial Regional Hospital)

ABSTRACT
This is a case of an 18 year old adolescent who was reared as a male. At the age of 12, due to complaints of recurrent hypogastric pain and dysuria, an ultrasound of the abdomen was done per request of the attending physician. Sonographic examination revealed the presence of a uterus and, since then, the patient was considered as a female. At 15 years of age, as the patient manifested right lower quadrant pain, the patient was admitted in our hospital wherein she underwent transabdominal ultrasound that revealed a cystic mass at the right adnexa. Patient underwent pelvic laparotomy and right oophorectomy due to a rupture ovarian new growth. Post-op, a cystogram through a suprapubic catheter was requested to confirm the presence of a suspected urethro-rectal fistula. Clinically, patient was also considered as a case of female pseudohermaphroditism, vaginal agenesis, and congenital adrenal hyperplasia. Due to complaint of cyclic rectal bleeding, patient was readmitted two years after. Initially, pelvic sonography and fistulogram was requested and performed. Findings of which prompted the surgeons to perform cystoscopy, proctoscopy, pelvic laparotomy and vaginostomy. Intra- and post-operatively, more imaging procedures were requested which ultimately revealed uterine didelphys with bilateral hematocolpos, ectopic anus, intestinal malrotation, duplex right kidney, hydrenephrotic ectopic left kidney versus left ovarian cysts and multiple fistulae. Patient was considered as a case of mixed Mullerian (Obstructed hemivagina and ipsilateral renal anomaly syndrome), urogenital and gastrointestinal anomalies with presence of various fistulae: right utero-enteric, right hemivagina-left hemivagina, left hemivagina-vesical, left hemivagina-rectal.

ANTERIOR ABDOMINAL WALL ABSCESS WITH ASCARIS AND TUBERCULOSIS
(BEST PRESENTOR)
Andro Reginald L. Licaros, MD, Mark Gerome G. Mauricio, MD, Dennis Raymond I. Sacdalan, MD, Jillian T. Samson, MD, Sheen C. Urquiza, MD, Paolo Miguel B. Verayo, MD (Philippine General Hospital)

ABSTRACT
Tuberculosis can involve any part of the gastro intestinal tract (GIT) and is the 6th most frequent site of extra-pulmonary tuberculosis. Tuberculous bacteria reach the GIT via hematogenous spread, ingestion of infected sputum, or direct spread from infected contiguous lymph nodes. Gross pathology of GITB may include ulcers, fibrosis, thickening and stricture of bowel walls, lymphadenopathies and omental thickening. Fistulae are rare complications. Studies also revealed increased incidence of parasitic infections in patients with tuberculosis, with Ascariasis being the most common helminthic infection.

We report in this study a 15 year old male who presented with an anterior abdominal wall abscess. Fistulogram, upper GI series (UGIS), ultrasound and CT-MRI of the chest and abdomen were done. The different imaging modalities revealed pleural effusion, bowel wall thickening, lymphadenopathies, multiple abscess formation in the abdominal cavity and anterior chest and abdominal wall. The CT and MRI studies revealed sinus tract formation, while the ultrasound and fistulogram revealed serpentine filling defects in the anterior abdominal wall abscess, later found to be Ascaris worms.

The MTB/RIF PCR of the anterior abdominal wall abscess was positive for TB.

This case illustrates multimodality images of abdominal TB with concomitant Ascaris infection.
LEFT SIDED APPENDICITIS
Durell S. Bettita, MD
(Far Eastern University-Nicanor Reyes Memorial Foundation Hospital)

ABSTRACT
The presence of a malrotation of the midgut in adults is identified in asymptomatic patients most commonly as an incidental finding during a workup for an unrelated disease. This report is a rare case of acute ruptured appendicitis in a patient with non-rotation of the midgut. A 30-year-old man was referred to our Institution due to left lower abdominal pain. The radiological examination, particularly computed tomography (CT) of the abdomen, revealed acute ruptured appendicitis accompanied by left-sided cecum. Emergency surgery revealed a ruptured appendix located in the middle area of the lower abdomen with periappendiceal abscess and non-rotation of the midgut. In this case, the atypical position of the appendix led to confusion regarding the diagnosis and to a more invasive surgical intervention. The objective of this study are to identify the different imaging modalities that should be used to diagnose cases of acute left sided appendicitis including its associated anomalies and to differentiate left sided appendicitis from other disease entities presenting with left sided abdominal pain. Intestinal malrotation is a defect or an incomplete rotation of the mid gut that results in a shortened mesentery with a displaced Treitz ligament and cecum. This rotation defect complicates with mid gut volvulus incase malrotation stops at 180° or could be asymptomatic if it stops at 90 giving rise to a complete common mesentery which rarely complicates hence explaining its fortuitous discovery on radiological imaging done for other indications. In conclusion, physicians should consider rotational abnormalities of the intestine in the differential diagnosis of patients with an acute abdomen. The appropriate radiological examinations should be performed to confirm of the diagnosis.