Positron Emission Tomography as a Preoperative Predictor of Malignancy in Thyroid Cancer

LEARNING OBJECTIVES
- By the end of this session, the clinician will understand the predictive value of the PET scan in determining whether malignancy is present, as well as how to apply it in concert with other data when available. In summary, the reader will understand the current role for PET scans in approaching patients with thyroid nodules.

ABSTRACT
OBJECTIVE: To evaluate the preoperative predictive value of a positive PET scan with respect to malignancy in patients undergoing thyroidectomy, particularly when the fine needle aspiration biopsy results in indeterminate findings. Also, to establish the role if any for this imaging modality in the preoperative workup of patients with thyroid nodules.

METHODS: This is a retrospective study examining 1048 thyroidectomy patients, of which 45 underwent PET scans for unrelated reasons, among which 13 were focally positive for thyroid nodules. Final pathology was evaluated in order to determine a correlation.

RESULTS: All patients with positive PET scans were shown post-thyroidectomy to have a thyroid malignancy (13/13) corresponding to a positive predictive value of 100%. There was no correlation between a negative PET scan and malignancy however. When integrating the PET scan criteria in the McGill Scoring System, 4 of these 13 patients are shifted into a high risk of malignancy group.

CONCLUSION: In comparison with previous data, these results indicate a strong relationship between a positive PET scan and malignancy. If available and used in conjunction with other preoperative tools this test may hold significant merit in determining a therapeutic strategy, particularly in the face of an indeterminate FNAB.

Comparison of Preoperative Ultrasonography, Radionuclide Scintigraphy, and SPECT in Localization of Parathyroid Adenomas
- B. Barber, D.W. J. Cote, J. Harris, EDMONTON, AB

LEARNING OBJECTIVES
At the end of this session, the participator should be able to:
1) Differentiate between ultrasound, radionuclide scintigraphy, and SPECT scanning,
2) Understand the contribution and capability of each imaging modality to localizing a parathyroid adenoma,
3) Understand the implications of our findings in minimally-invasive parathyroid surgery.

ABSTRACT
BACKGROUND: Recent advancements in minimally-invasive parathyroid surgery have influenced the use of imaging modalities for precise preoperative localization of parathyroid adenomas (PA). Ultrasonography (US), radionuclide scintigraphy (RS), and SPECT scanning have been used both individually and cooperatively to localize lesions, but to date all three modalities have not been collectively compared for their accuracy.

OBJECTIVES: To compare the accuracy of US, RS, and SPECT in localizing PAs.

METHODS: 198 patients with PAs were reviewed. The size, number, and quadrant shown by each imaging modality were compared to surgical findings. Localization results were classified as pass, fail, or undetected.

RESULTS: In preliminary analysis, 30% of PAs were undetected by US, as compared to 15% and 2% for RS and SPECT, respectively. 100% of the lesions undetected by SPECT were also undetected by US and RS. Rates of failure of localization were significantly higher with US when compared to RS (p<0.05) and SPECT (p<0.05). 11% of lesions incorrectly localized by US were situated in atypical locations when dissected surgically.

CONCLUSIONS: SPECT is superior to RS and US in localizing ectopic and atypically situated parathyroid adenomas. US is a convenient and economic modality for localizing abnormally enlarged glands, but requires complementary imaging when parathyroid adenomas are smaller or atypically situated.

The Surgical Management of Differentiated Thyroid Cancer in Ontario: A Population-based Study
- S. F. Hall, J. Irish, S. Archibald, R. Walker, D. Hurlbut, P. Groome, A. Schneeberg, KINGSTON, AB
**LEARNING OBJECTIVES**

- At the end of this session attendees will have a greater understanding of the extent and origins of the variation in the treatment of differentiated thyroid cancer.

**ABSTRACT**

**BACKGROUND:** There is no agreement on the extent of surgery for the majority of patients with differentiated thyroid cancer.

**OBJECTIVES:** To describe and compare the extent of surgery by histology, tumor size, geographic region, surgeon specialty and surgeon age.

**METHODS:** A population-based study, based on the Ontario Cancer Registry, of 3500 Ontario patients from 1990 to 2002 with a new diagnosis of differentiated thyroid cancer using electronic data, pathology review and operative record review.

**RESULTS:** There was considerable variation in both tumor size and management by geographic region and there was variation in the extent of surgery for similar tumors by region and surgical specialty.

---

**Endoscopic Thyroid Surgery Using the Minimally Invasive Video-Assisted Thyroidectomy Technique - Is It Safe?**

- N. Jowett, M. Black, M. Hier, S. Anand, V. Labajian, MONTREAL, QC

**LEARNING OBJECTIVES**

1. To discuss the potential advantages and disadvantages to minimally invasive video-assisted thyroid surgery, a new approach to subtotal thyroidectomy.
2. To demonstrate the surgical technique of minimally invasive video-assisted thyroid surgery.

**ABSTRACT**

**OBJECTIVES:** Endoscopic thyroidectomy, using the minimally invasive video-assisted thyroidectomy (MIVAT) approach, offers the potential for improved cosmetic outcome in thyroid surgery, but its safety profile has yet to be fully established.

**METHODS:** Patients with thyroid nodules underwent subtotal thyroidectomy using the endoscopic MIVAT approach and were compared with traditional subtotal thyroidectomy controls at a McGill University teaching hospital. Outcome measures included complication rates (recurrent laryngeal nerve injury, inadvertent parathyroid gland removal, and hematoma), incision length, operative time, and time in hospital.

**RESULTS:** Preliminary data shows that patients undergoing MIVAT surgery had smaller incisions when compared to those undergoing traditional surgery (1.5cm vs 3.0cm, p<0.05). There was also no significant difference in complication rates (0.1 vs 0.1, p>0.05), time in hospital (21.3hrs vs 21.1hrs, p>0.05), or operative time (73.1min vs 75.0min, p>0.05).

**CONCLUSIONS:** According to this study, endoscopic thyroidectomy performed using the MIVAT approach, appears to be safe when compared to traditional subtotal thyroidectomy. The length of incision is smaller with only a minimal increase in operative time. These results support the use of this technique in selected patients.

---

**Mechanical Creep in Minimally Invasive Thyroidectomy Incisions: Quantification and Identification of Predictive Factors**

- M. Mohammed, K. Fund, J. Yoo, J. Franklin, LONDON, ON

**LEARNING OBJECTIVES**

1. To understand the entity of mechanical creep
2. To know the predicted creep on the basis of the present literature
3. To understand the quantification of mechanical creep identified in thyroid incisions.
4. To understand the forces and mechanism of creep and its resolution over time/
4. To acknowledge the importance of creep in the planning of incision size

**ABSTRACT**

**Background:** Minimally invasive thyroidectomy is an increasing trend. A limiting factor to the incision size is tumor size. Biological or mechanical creep have been documented and characterized in other surgical procedures. This study aims to characterize the expected mechanical stretch observed in minimally invasive thyroidectomy incisions and to define factors affecting the degree of creep.

**Methods:** 50 Consecutive minimally invasive thyroidectomies performed by the senior author. Measurements were taken prior to the incision, after the incision and at the completion of the skin closure. Incisions were then measured at the first post-operative visit. Factors including surgical time, age and gender will be analyzed.
Results: All incisions showed greater than 10% creep. The smaller incisions showed significantly greater percent creep than larger incisions. There were no other identified predictive factors.

Conclusions: Thyroid incisions extend significantly throughout a thyroidectomy thereby allowing for smaller planned incisions.

**A Prospective Evaluation of Perioperative Concern Amongst Patients Considering Thyroidectomy: Preliminary Normative Data**

- H. A. Osborn, M. G. Brandt, J. Yoo, K. Fung, P.C. Doyle, LONDON, ON

**LEARNING OBJECTIVES**
- At the completion of the presentation, attendees will have an improved understanding of the areas of concern experienced by patients considering thyroidectomy.
- Attendees will become familiar with a novel assessment tool evaluating patient perioperative concerns.
- At the completion of the presentation, attendees will be able to direct their perioperative counseling to include the areas of greatest concern experienced by patients considering thyroidectomy.

**ABSTRACT**

OBJECTIVES: Patients considering surgery face many uncertainties and concerns. Through the use of a recently validated assessment tool, this investigation sought to characterize the areas of greatest concern amongst patients considering thyroidectomy.

METHODS: All patients considering thyroidectomy (hemi- or total) were voluntarily recruited. Those with lesions necessitating central or lateral neck dissection were excluded. 150 individuals completed a novel 18-item questionnaire during their initial clinical visit. Outcomes included descriptive statistics and preliminary normative data.

RESULTS: Areas of greatest concern varied by indication for thyroid surgery. As a group, patients considering thyroidectomy were most concerned by the risk of: cancer, a change in voice, and pain and discomfort. Areas of minor concern included the risk of being embarrassed by one’s condition, being judged, or not having their questions answered. In those patients with intermediate risk (15-20% risk of papillary thyroid cancer) fine-needle aspiration biopsy results, those choosing hemi-thyroidectomy differed in concerns from those choosing total-thyroidectomy.

CONCLUSIONS: Patients considering thyroidectomy have unique concerns requiring surgeon initiated inquiry and counsel. This investigation provides preliminary normative data that builds on previous findings in establishing the Western Surgical Concern Inventory – Thyroid (WSCI - T) as a means of ensuring adequate patient co (original incomplete)

**Sentinel Lymph Node Biopsy in the Management of Thyroid Cancer: Where We Currently Stand**


**LEARNING OBJECTIVES**
- By the end of the session thyroid surgeons will have a better understanding of our current knowledge of the role of sentinel lymph node biopsy in the management of well differentiated thyroid carcinoma.

**ABSTRACT**

OBJECTIVE: To prospectively review the role of sentinel lymph node (SLN) biopsy in the management of well differentiated thyroid carcinoma (WDTC), and determine whether frozen section analysis accurately predicts the status of the SLN.

METHODS: SLN biopsy was performed on consecutive patients undergoing thyroidectomy for nodules suspicious for WDTC. Nodules were injected with 0.2-0.3cc’s of methylene blue. A central compartment neck dissection was performed. Lymph nodes that stained blue were considered as SLNs. Frozen section analysis of the SLN was undertaken for twenty patients.

RESULTS: 191 patients underwent SLN biopsy and central compartment neck dissection. 138 patients had WDTC. 76% (105/138) of patients were found to have detectable SLNs. No patients (0/ 33) with an undetectable SLNs were found to have central compartment metastasis. 26% (27 of 105) of patients had positive SLNs for metastasis. A negative SLN corresponded with a negative central compartment 100% of the time (78/78, sensitivity 100%, p-value<0.001). Frozen section was able to detect metastasis in 25% (5 of 20) of patient’s SLNs.
CONCLUSION: Our data shows that a negative SLN on final pathology correlates strongly with a negative central compartment. More data is needed to better understand the role of frozen section.

Use of USFNAB in the Management of Previously Biopsied Non-diagnostic Thyroid Nodules – Does Operator Experience Matter?

ABSTRACT
OBJECTIVE: To compare the specimen adequacy rate of ultrasound guided thyroid fine needle aspiration biopsies based on nodule size performed by an experienced thyroid surgeon vs otolaryngology residents in patients whose initial palpation guided FNA biopsies (PGFNAB) were non-diagnostic.

METHODS: Multiple logistic regression analysis was used to investigate the effect of operator experience on the probability of obtaining an adequate specimen, after adjusting for nodule size. SAS version 9.1.3 was employed for statistical analysis with P values < 0.05 indicating statistical significance.

RESULTS: The specimen adequacy rates of the staff and residents were 93.2% (179/192) and 42.9% (18/42) respectively. Multiple logistic regression demonstrated a significant difference of the staff vs residents in terms of the probability of obtaining an adequate specimen even after adjusting for nodule size with an odds ratio of 17.4 (95% CI (7.4, 41.2)). There was no interaction effect between examiner and nodule size.

CONCLUSION: Our experience suggests that specimen adequacy rates of thyroid nodules with USFNAB is significantly influenced by operator experience. This finding highlights the high level of difficulty associated with this type of diagnostic intervention, and that proper training is necessary prior to performing USFNAB in the clinical setting.

Correlation of Preoperative Fine Needle Aspiration Findings with Histopathology following Diagnostic Hemithyroidectomy
- J.A. Vaz, D.W.J. Cote, H. Seikaly, EDMONTON, AB

LEARNING OBJECTIVES
1) By the end of this session, the participant will be able to describe the types of thyroid nodules that are typically investigated with diagnostic hemithyroidectomy.
2) By the end of this session, the participant will be able to evaluate the diagnostic accuracy of fine needle aspiration biopsy.
3) By the end of this session, the participant will be able to evaluate the use of fine needle aspiration biopsy in pre-operatively predicting malignancy in nodules that subsequently investigated with diagnostic hemithyroidectomy.

ABSTRACT
BACKGROUND: Diagnostic hemithyroidectomy is indicated for suspicious and atypical thyroid nodules. There is limited literature on the accuracy of pre-operative diagnosis by fine needle aspiration biopsy (FNAB) and its correlation to final pathologic findings in diagnostics.

METHODS: A review of all patients undergoing diagnostic hemithyroidectomy who had pre-operative pathology confirmed by FNAB since Oct 1, 2001. FNAB results were classified as either benign, follicular, Hurthle cell, or malignant.

RESULTS: 171 cases were reviewed. Final pathology found 125 benign lesions and 46 malignant lesions, which included B cell lymphoma (n=1), medullary carcinoma (n=1), follicular carcinoma (n=6) and papillary carcinoma (n=38). Preoperative FNAB cytology predicted 3 malignant lesions, of which only one case of malignancy was confirmed by histopathology. When FNAB diagnosis suggested benign lesions (n=84), 31% (n=26) were found to be malignant lesions. Similarly, when FNAB suggested follicular(n=65) or Hurthle cell (n=19) lesions, 20% and 31.6% of cases respectively were found to be malignant post-operatively.

CONCLUSIONS: Of thyroid nodules that are typically sent for diagnostic hemithyroidectomy, malignancy is poorly predicted by FNAB.