

## **Prognostic value of inflammatory markers in Anaplastic Thyroid Cancer**

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### **Background**

Anaplastic Thyroid Cancer (ATC) is a highly aggressive disease. Inflammation-based scores are increasingly being used as prognostic markers in diverse malignancies. The aim of this study was to determine if such scores correlate with overall survival (OS) in ATC patients.

### **Method**

Retrospective cohort analysis of consecutive unselected patients managed within a Multidisciplinary Team meeting. Diagnosis was confirmed by cytology or resection histopathology, with genetic analysis on recent patients. Neutrophil-to-leukocyte ratio (NLR), platelet-to-leukocyte ratio (PLR), CRP-to-albumin (CAR) were calculated based on blood tests at diagnosis.

### **Results**

Between 2014-2024, ATC was diagnosed in 22 patients (age 74±9 yrs, M:F ratio 1:4). Fourteen (63%) patients had surgery within 4 weeks of diagnosis, of whom eight had adjuvant therapy. Eight patients did not have surgical treatment and underwent palliative radiotherapy (n=2) or best supportive care (n=6). Genetic analysis revealed heterogeneity between samples, with mutations found in p53, BRAF, RET, and TERT.

There was minimal benefit in those undergoing surgery, median OS 16 vs 5 weeks respectively, p=0.13. Inverse correlation with OS was seen with age, metastases, and inflammatory scores. Compared with lower quartile OS, patients with upper quartile OS had significantly lower PLR (165±67 v 418±158, p<0.01), NLR (3.5±1.9 v 14.9±8.2, p=0.02), and CRP (3.5±1.8 v 38.9±13.5mg/L, p=0.12). Time to death correlates to CAR (1.7+-2.95, p=0.013).

### **Conclusion**

Overall survival in ATC has significant variability. Age, the presence of metastases, and inflammatory markers could provide guidance in shared decision making.

**The dynamic nomogram is useful to “rule out” HBS but needs validation in larger cohorts.**

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### Background

Recently a dynamic nomogram to predict hungry bone syndrome (HBS) based on preoperative age, serum parathyroid hormone, and corrected calcium in patients undergoing parathyroidectomy was published by Cao et al 2024. The aim of the study was to evaluate the efficacy of the nomogram to predict HBS in a Southeast Asian population.

### Method

Retrospective cohort analysis of patients who underwent surgical therapy for renal hyperparathyroidism between the years 2000 – 2023. Patient demographic profiles, biochemical and surgical data, outcomes of intervention and incidence of HBS were collected. The parameters of age, PTH and calcium were entered into the dynamic model accessible on <https://min115.shinyapps.io/dynnomapp/>) to compute the risk of HBS. Factors predictive of HBS for the cohort was calculated the sensitivity, specificity, PPV, NPV and diagnostic accuracy was compared between the actual and predicted model.

### Results

250 (136F: 114M) patients with a mean age of 56.4 ( $\pm 10.2$ ) years underwent parathyroidectomy during the study period. HBS was seen in 59 of 250 (24%) of patients and the only predictor of HBS in the cohort was preoperative serum PTH value ( $p=0.003$ ). The AUC of the internally validated model was 0.72 (95% CI 0.648–0.791) ( $p=0.001$ ). The sensitivity of the dynamic nomogram was 56%, specificity 80%, PPV 46% and NPV 85% for the cohort. Likelihood ratio for positive test results (LR+) for the cohort was 2.8 and Likelihood ratio for negative test result (LR-) of 0.35.

### Conclusion

The dynamic nomogram is useful to “rule out” HBS but needs validation in larger cohorts.

## **Investigating the Risk of Malignancy in Thyroid Nodules- Impact of Radiological Features- a UKRETS study**

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### Background

To investigate whether the influence of the ultrasound (U) score of a thyroid nodule on the risk of malignancy (ROM) in different cytological categories. Furthermore, whether higher U scores (U4/5) are associated with PTC rather than FTC/other cancer types, compared to U3 nodules

### Method

From the UKRETS database, demographic, radiologic, cytologic and histopathologic data was extracted for 3726 patients. For each cytological category the ROM was calculated for nodules with different ultrasound scores. Statistical analyses including Fisher's exact test, simple linear regression and correlation analyses were performed using Graphpad prism software (version 10).

### Results

There was a positive correlation between ROM and increasing U scores in nodules with inadequate (Thy1) and follicular neoplasms (Thy3f) ( $r^2=99\%$  and  $97\%$ ,  $p=0.007$  and  $0.015$  respectively). In Thy1 and Thy3f, the ROM was significantly higher in U4 and 5 nodules (ROM= 46% and 45% respectively) compared to U3 (ROM= 24%) nodules. In Thy2, 3a, 4, and 5 nodules the ROM did not correlate with the U score. A diagnosis of FTC was more likely (odds ratio=5.22 (CI=2.97-9.10),  $p< 0.0001$ ) in U3 compared to U4/5 nodules.

### Conclusion

In patients with Thy1 and Thy3f nodules, the higher ROM in U4/5 ultrasound scores compared to U3 may warrant a higher index of suspicion and more aggressive management. This would aid surgeons in providing patients with a more accurate ROM, thus improving decision making. Our analysis shows that U4/5 scores have higher specificity in identifying PTCs and lower for FTCs, future studies can focus on identifying specific radiological features for FTC.

## **Short term outcomes following robotic adrenal surgery in a large tertiary referral hospital**

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### Background

Laparoscopic surgery has been the standard approach to adrenalectomies for over 20 years. However, robotic adrenalectomies have begun to emerge and their effectiveness is evident. This paper reports on the outcomes of robotic adrenalectomies performed in a tertiary referral hospital in the Northeast of England

### Method

Over 2-year period (2022-2024), 67 robotic adrenalectomies were performed. Data was collected retrospectively from a prospective database. Data collected included age, sex, comorbidities, BMI, indication for surgery, conversion rates, docking time, console time, length of stay and tumour size.

### Results

Data was collected from 67 robotic adrenalectomies. Of these 67 cases, 64% were female and the median age for males and females was 59 and 61 respectively. The median BMI was 28 (21-57). Pheochromocytoma accounted for 24% of the cases, Conn's syndrome 31% and Cushing's disease 22%, with the rest performed for metastasis or indeterminate causes. Median tumour size was 3cm (ranging from 1cm to 14cm). Outcomes were positive with a median docking time of 5 minutes and a median time on the console of 45 minutes. Median length of stay following surgery was 1 day. There was only 1 conversion and no major complications.

### Conclusion

The data from these 67 cases demonstrates the safety and effectiveness of robotic assisted adrenalectomies especially for patients with a high BMI. However, large randomised controlled trials are needed to fully evaluate the efficacy of robotic assisted adrenalectomies.

## **How to establish a surgically-led Radiofrequency Ablation (RFA) thyroid ablation service in the UK**

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### Background

The aim of this study was to describe how we established a surgically-led Radiofrequency Ablation (RFA) thyroid ablation service in the UK, offering a minimally invasive alternative for treating benign thyroid nodules and enhancing patient care.

### Method

We began by developing a detailed business case that outlined clinical benefits, demographics and resource requirements. This was submitted to the Clinical Governance Board for approval. Compliance with NICE guidelines was ensured. Surgeons and radiologists underwent accredited RFA training courses. An experienced proctor was engaged for on-site training and oversight of initial procedures. A multidisciplinary team comprising surgeons, radiologists and nursing staff was formed to manage all aspects of patient care. A dedicated procedure room within the hospital was equipped with RFA devices, ultrasound machines, and facilities for patient monitoring, ensuring a sterile and efficient environment.

### Results

In the pilot phase, RFA was performed on 10 patients under close supervision. Regular auditing of results and feedback were utilized to monitor outcomes and refine procedures. Initial results demonstrated successful nodule ablation with minimal complications, confirming the procedure's safety and efficacy. The ENT team approach facilitated seamless patient care, from pre-procedure evaluation to post-procedure follow-up.

### Conclusion

Setting up a surgically-led RFA thyroid ablation service in the UK is both feasible and beneficial. Success relies on thorough planning, regulatory compliance, and effective collaboration among a multidisciplinary team. Initial results indicate that the service provides a safe and effective alternative to traditional thyroid surgery, improving patient care and expanding treatment options for benign thyroid nodules.

**POST-SURGICAL HYPOPARATHYROIDISM AND THE IMPACT OF EXPERIENCE, TIMING OF SURGERY AND SEASONS – ANALYSIS OF SINGLE SURGEON DATASET**

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**Background**

Post-surgical hypoparathyroidism (PoSH) is a complication of thyroidectomy associated with poor quality of life, increased cost of care, morbidity and mortality. The clinical and biochemical predictors of PoSH have been evaluated in previous studies. This study explores putative factors like the surgeon's experience, timing of surgery and seasonal impact on PoSH.

**Method**

A retrospective cohort study in a high-volume centre. Patients who underwent total or completion thyroidectomy (TT/CT) performed by a single surgeon from January 2010 to December 2022 were included. Key outcomes were postoperative hypocalcaemia (adjusted serum calcium <2.1 mmol/l on the first postoperative day), and long-term PoSH (the need for calcium and/or alfacalcidol at 6 months after surgery). Demographics, perioperative and clinical data up to six months were analysed

**Results**

Of the 668 thyroid operations performed by the surgeon, 632 (94.6%) were included for analysis. The median age was 47.3 (18 – 87) years. TT was done in 82.4% and CT in 17.6%. Central neck dissection (CND) was performed in 26.9%. Postoperative hypocalcaemia and long-term PoSH rates were 19.9% and 4.9% respectively. CND significantly increased the rate of long-term PoSH (3.3% in TT vs 9.2% in TT +CND; p 0.02 and 1.7% in CT vs 8.2% in CT + CND; p 0.02). Increasing surgical experience, surrogate variables for surgeon fatigue and seasons did not change the rate of PoSH significantly.

**Conclusion**

The study confirmed CND as a risk factor for long-term PoSH but did not find surgeon experience, fatigue, and seasons to have an impact on PoSH rate.

## **Comparative Analysis of Robotic, Laparoscopic, and Open Adrenalectomies for Pheochromocytomas**

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### Background

Robotic adrenalectomy (RA) has emerged as a promising alternative to laparoscopic and open approaches for managing adrenal tumours. This review explores the utility of robotic adrenalectomies in the context of pheochromocytomas.

### Method

We conducted a retrospective cohort study from 2019 to 2023, focusing on patients undergoing RA, laparoscopic adrenalectomy (LA), and open adrenalectomy (OA) for pheochromocytomas. Primary outcome measured included intraoperative stability. Secondary outcomes measured included operative times, conversion rates, length of stay, post operative location and complication rate.

### Results

61 patients were included in the study (RA: n = 17, LA: n = 39, OA: n = 5). Haemodynamic instability was lower in the RA group compared to LA (difference in MAP of 40.21 vs 50.68). Mean operative times were significantly shorter in the RA group when compared to LA and OA (58.50 minutes vs 98.38 vs 187.14 minutes respectively,  $p < 0.05$ ). Length of stay was significantly less in RA when compared to OA (1.75 days vs 7.86 days,  $p < 0.01$ ) and when compared to LA (1.75 days vs 3.88 days,  $p = 0.16$ ). The conversion rate of RA was 6% vs 3% in LA. 69% of patients within the RA group required intensive care monitoring, compared to 95% of patients in LA and 100% of patients in OA.

### Conclusion

RA resulted in less haemodynamic instability, less blood loss, shorter length of stay and operating time. These findings support the use of RA as a surgical modality for pheochromocytoma management.

**Thyroid disease in the elderly, considering care in the context of projected growth of the geriatric population**

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**Background**

The proportion of geriatric ( $\geq 65$  years) patients globally is projected to rise from 12% to 22% by 2050. This study investigates differences in surgical thyroid disease between patients over 70 years to inform future care.

**Method**

Retrospective cohort from 2018 to 2022. Comparing demographics, presentation, intervention, and outcomes for patients aged  $\geq 70$  years to a younger co-hort.

**Results**

Of 218 consultation records 93 patients were  $\leq 65$  years, 78% female with median age 43 years. 17 patients (18%) underwent surgery, and 4 (24%) had thyroid cancer.

125 patients, 58% female, median age 77 years  $\pm 7.78$  (78  $\geq 70$  years, 29  $\geq 80$  years, 17  $\geq 85$  year). 59 (47%) underwent surgery, in an average of 3 months  $\pm 3.55$ , females were operated earlier ( $p=0.014$ ). The Charlson comorbidity score was not significant between operated and unoperated groups ( $4.51 \pm 0.7$ ). Of operated patients 19 (32%) had cancer. Male patients ( $p=0.09$ ) and  $< 80$  years were more likely to have cancer ( $p=0.012$ ). Incidental thyroid pathology was seen in 45 (36%) patients. 30% of surgery was for hyperthyroidism, all hyperthyroid patients with goitre had been consulted previously without waitlisting. Twenty-two patients died: 12 not fit for surgery and 3 operated died within 2 years of surgery. 3 (5%) had recurrent laryngeal nerve (RLN) injury.

**Conclusion**

A greater proportion of consulted patients  $\geq 70$  years undergo surgery with higher incidence of thyroid cancer, often asymptomatic. Comorbidity scores do not impact surgical decisions, but complications presumably affect quality of life, highlighting need for careful decision-making in geriatric thyroid surgery.



**Prognostic significance of surgically-treated malignant struma ovarii with or without adjuvant thyroid-related therapy: A systematic review and meta-analysis**

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**Background**

To determine the long-term overall survival (OS) after surgically-treated malignant struma ovarii (MSO) and to evaluate prognostic effect of adjuvant thyroid-related therapy in this setting.

**Method**

A systematic review in compliance with PRISMA statement standards was conducted. Electronic information sources were searched to identify all case reports and case series evaluating OS in patients with surgically-treated MSO and a cohort of eligible patients was created. The OS was determined using Kaplan–Meier survival statistics and a stepwise Cox proportional-hazards regression model was constructed to identify the predictors of OS.

**Results**

The study included 376 patients (95 from case reports and 281 from case series). The median age was 44; 79% (79/95) were symptomatic. In terms of adjuvant thyroid-related therapy, 39% (37/95) received total thyroidectomy, 28% (27/95) radioactive iodine therapy, 28% (27/95) thyroid hormone suppression therapy, and 55% (52/95) received no thyroid-related therapy. Recurrence occurred in 27% (26/95) with median time to recurrence of 4 years. The pooled OS was 91% at 10 years and 87% at 20 years. The OS was not predicted by age ( $p=0.320$ ), symptomatic status ( $p=0.371$ ); omentectomy ( $p=0.523$ ); total thyroidectomy ( $p=0.371$ ); radioactive iodine therapy ( $p=0.285$ ); thyroid hormone therapy ( $p=0.994$ ).

**Conclusion**

Surgically-treated MSO may have excellent long-term prognosis with or without adjuvant thyroid-related therapy. It is possible that thyroid-specific treatments in MSO constitute overtreatment, with no demonstrable survival benefit. Limitations in the evidence-base preclude definitive conclusions.

## **Four-dimensional computed tomography scan - what should we be looking for?**

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### Background

The objective of this study was to identify and analyse the usefulness of different enhancement patterns on four-dimension computed tomography (4DCT) and highlight important factors for identification of abnormal glands.

### Method

Retrospective data was collected on 100 resected parathyroid glands with proven disease and pre-operative 4DCT scans. Hounsfield units (HU) of the parathyroid glands and surrounding normal thyroid tissue in all phases was measured and glands were grouped according to enhancement pattern. The percentage change in HU was calculated between the three phases. Data was analysed for evidence of statistical significance using the Mann-Whitney U test.

### Results

35% of glands demonstrated an enhancement pattern that is described as classic for parathyroid glands, with the other 65% being split into three further enhancement pattern groups. There was a statistically significant increase in enhancement between the pre-contrast and arterial phases, with a mean percentage increase of 433% in the enhancement of parathyroid glands compared to a 209% for adjacent thyroid.

### Conclusion

The relative enhancement characteristics between diseased parathyroid and adjacent thyroid tissue in different phases are variable and cannot be relied upon in isolation. This study also demonstrated a significant difference in percentage change of HU in diseased parathyroid glands between phases compared to adjacent thyroid, suggesting that this measurement may be used to identify diseased parathyroid glands. In addition, a thorough understanding of anatomy, embryology and possible ectopic gland locations is essential in the identification of abnormal parathyroid glands.

**Characteristics of patients over 70 years of age consulted for primary hyperparathyroidism, surgery dominates over conservative management**

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**Background**

Primary hyperparathyroidism has an incidence of 95–196 per 100,000 in patients aged 70–79 years, with clinical manifestations differing from younger populations. This study aims to define geriatric parathyroid surgical care in older patients.

**Method**

A retrospective review of operated patients >70 years in endocrine surgery from 2018-2023 was conducted.

**Results**

Of 92 patients referred for surgical consultation, 79% were female (73F:19M) with a median age of 78 (IQR 70-90). Surgery was performed on 95% (87/92) of patients, with non-operated patients all >80 years. Median calcium was 2.76 mmol/l (2.56-3.72), with 30% had calcium >3 mmol/l. The cure rate was 94.3%, with 61% not localised on imaging preoperatively, non-localised disease trending in correlation to older age (p=0.07). The post-surgical complication rate was 3%. Osteoporosis was present in 22%, with 35% having some degree of bone disease. The fracture rate was 7.6%, associated with bisphosphonate therapy (p=0.05) and medical management of hypercalcaemia (p=0.01). No patients had myocardial events during the review period. Six patients (6.9%) died within 4 years, including 3 non-operated patients.

**Conclusion**

Consistent with international reviews for those >70 years, surgery is not associated with high mortality or complication rate, and consultation has a high conversion to surgical care. Bone disease and fracture risks are notable. Further data on geriatric patients with primary hyperparathyroidism not referred for surgery is needed.