Abstracts for the Alan Edwards Poster Prize Presentation

at the 2020 BASO Annual (virtual) Scientific Meeting
21st – 23rd November 2020

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Poster 12: 21-gene recurrence score testing and adjuvant chemotherapy in older women with early breast cancer

Olga White, Jenna Morgan, Malcolm Reed, Kwok Leung Cheung, Ricardo Audisio, Alistair Ring and Lynda Wyld on behalf of the Age Gap trial steering committee and the University of Sheffield

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Introduction / Background

Adjuvant chemotherapy for breast cancer can reduce recurrence and improve mortality[123456], but its benefit in older women (70+) is unknown[7]. This is particularly unclear in patients with an intermediate recurrence risk, for whom the side effects of chemotherapy may not outweigh the marginal decrease in recurrence risk[489].

Recommendations for adjuvant chemotherapy are based on a multidisciplinary assessment of prognostic factors. Oncotype DX is a genomic test which predicts recurrence risk and chemotherapy benefit based on tumour expression of 21 different genes, giving a recurrence score (RS) from 0-100. NICE endorses its use in patients with early oestrogen receptor-positive, HER2-negative, lymph node-negative cancers, and an intermediate recurrence risk according to population-based models. It is indicated when results would affect patient or clinician decision making, in order to prevent the overuse of chemotherapy in patients less likely to derive benefit. Its use has coincided with a 13% decline in chemotherapy use in this population[1011], as well as being independently associated with better survival[12]. High risk patients (RS>25) should be considered for chemotherapy, whereas surgery and endocrine therapy is noninferior in women aged >50 with an RS <25[7].

Women aged 70+ are underrepresented in clinical trials, particularly considering the proportion of the patient population that they make up[13]. Treatment guidelines have therefore been developed based on studies of younger women, and there is a limited evidence base pertaining to the efficacy of treatments including chemotherapy[14] and genomic testing in older women, which can limit their use[1516].

Objectives

This study investigated Oncotype DX testing and chemotherapy use in women aged 70+, for whom the test is not yet validated.

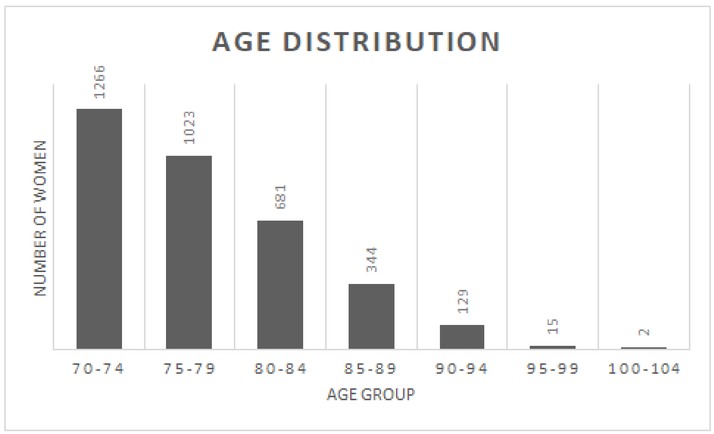

Chart 1. .Age breakdown of the study population. N = 3460, mean 77.6 ± 0.10, range 70 – 102.

Methods and Materials

3460 women aged 70 or over (mean age 77.6 ± 0.10, Chart 1) were recruited from 56 UK breast units. Ethics approval and research governance approval were obtained (IRAS 12 LO 1808). Data from patient questionnaires and medical notes were compared using Chi^2 tests.

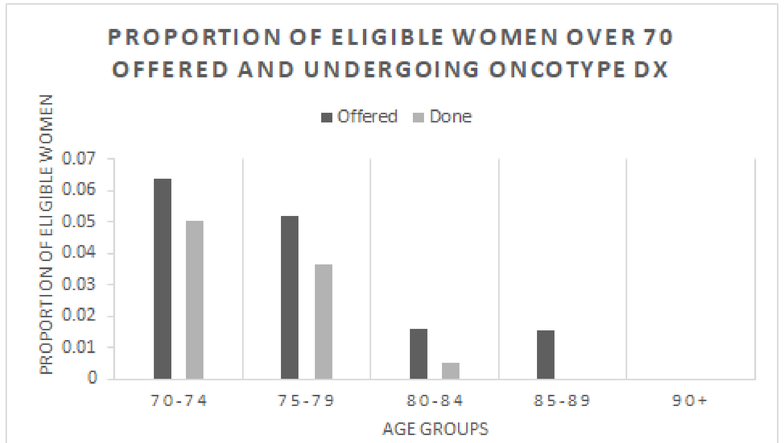

Chart 2. Proportion of eligible women (oestrogen receptor-positive, HER2-negative, lymph node-negative early breast cancer who were offered and underwent Oncotype DX testing. There is no significant difference in likelihood of the test being offered with increasing age over 70 (p = 0.0642), but there is a significant difference in those who actually had it (p = 0.02670.

Results

Only 41/1112 (3.69%) of eligible tumours underwent Oncotype DX testing. Older patients were not less likely to be offered testing (p = 0.0642), but there was a significant difference in those who actually had the test (p = 0.0267) (Chart 2).

Recurrence score (mean 20.1 ± 2.18) did not change with increasing age (p = 0.823 – 1). (Chart 3).
4/39 (10.3%) of women who had Oncotype DX testing had chemotherapy, which was not significantly different to the 11% (375/3421, p = 0.895) who did not have the test.

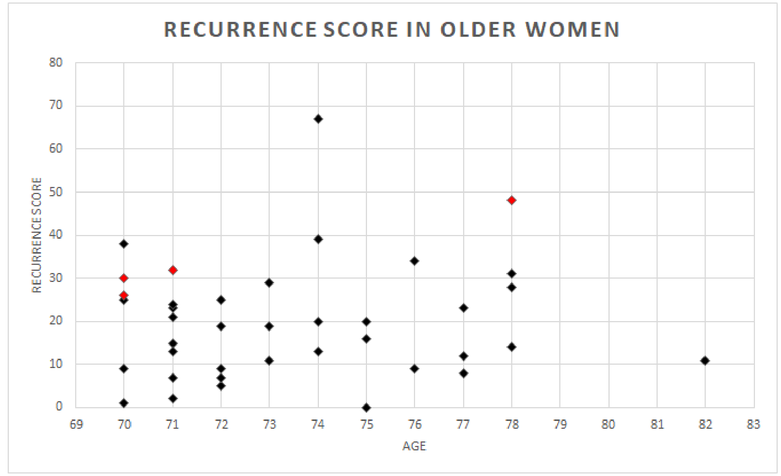

Chart 3. Age had no significant effect on RS in women aged 70+ (p = 0.823 – 1). Women who had chemotherapy are highlighted in red (RS = 26, 30, 32, 48)

Discussion

The percentage of eligible tumours sent for Oncotype DX testing (3.69%) was lower than previous studies in the same and younger age groups[1718]. This could potentially be explained by patient preference and comorbidities, or by age bias, which is suggested by the high variability (0 - 29%) in adjuvant chemotherapy use across different breast units[19]. Older patients were less likely to be tested than younger patients, potentially due to a lower perceived benefit of chemotherapy even if the score were to indicate a high chance of recurrence: increasing age decreased a patient's chance of having chemotherapy with an RS > 25, concurring with previous work[1719].

While previous research found that using Oncotype DX reduces chemotherapy rates, in this study there was no significant difference. This must however be considered in the context of the small sample size and lack of a control group, as well as the fact that the data collection period predates the publication of the influential TAILORx study and corresponding 2018 NICE guidelines update, and does not show trends over this time period. Additionally, a recent study found prognostic value for Oncotype DX but did not find that chemotherapy decreased mortality in older women with RS >25[17].

Conclusions

It is unknown whether eligible patients in this cohort did not undergo Oncotype DX testing because of lack of validation, guidelines, patient preference, cost or age bias. Qualitative analysis of the decision making behind testing and utilization of the results would therefore be useful, particularly in the group of patients with high RS who did not have chemotherapy. This would present a picture of its current role for women over 70, which could be used as a starting point for optimisation.

Optimisation could include different cutoff values or even utilising a different gene selection: mutations in older women's breast cancers were most notably found in PIK3CA, CDH1 and MAP3K1[20], none of which are included in the Oncotype DX array. Patients could also be stratified by biological rather than chronological age, using a comprehensive geriatric assessment, which might provide better concordance with RS and chemotherapy outcomes.

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Poster 26: Pathological response in axillary lymph nodes after neo adjuvant hemotherapy in node positive breast cancer

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Introduction

- Neoadjuvant chemotherapy (NAC) is increasingly used in selected patients to downsize tumour, to enable breast conserving surgery and also to assess tumour response in-situ.
- NAC was initially used in locally advanced and inflammatory breast cancer, but its role has now been expanded[1]. NAC not only downsizes the breast tumour but also the axillary nodal burden. [2]
- Achievement of a pathological complete response (pCR) in the breast and lymph nodes after NAC has been shown to correlate with an improved outcome compared to those that do not achieve a complete response. [3]
- While axillary node clearance is important for staging the disease and for loco-regional control, it is associated with several complications.
- Bearing this in mind, the pathological response in the axillary lymph nodes to NAC has been a matter of interest. [2]

Aims

To determine the node positivity after axillary node dissection (AND) in patients who were node positive at diagnosis and underwent NAC for breast cancer.

Methods

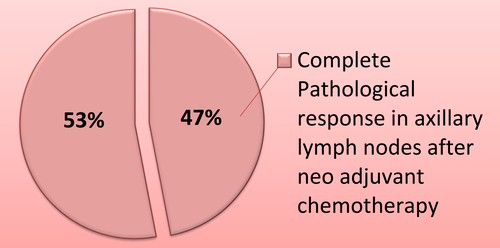
A retrospective study of consecutive patients over a 7-year period from January 2013 to December 2019, who were node positive at diagnosis and had axillary clearance following NAC was performed.

Result

~ n= 97
~ Mean age- 51 years (29 to 76 years)
~ 46 patients (47%) -complete pathological response in the axillary lymph nodes. (Figure)
~ Oestrogen receptor (ER) positive - 57 patients.
~ Her-2 receptor positive - 30 patients
~ Triple negative (ER-negative, PR-negative and Her-2 negative)- 34 patients

- The tumour was grade 1 in three patients, grade 2 in 57 patients and grade 3 in 38 patients.
- The invasive cancer was ductal in 85 patients, lobular in 7 patients and mixed in 5 patients.
- Mastectomy was performed in 48 patients and 49 patients had breast conserving surgery.

Figure



Conclusion

~ 47% patients had complete pathological response in the axilla.

~ This is concordant with reports in the current literature (range of 49% to 74%)
~ Since down-sizing of the axilla by chemotherapy has important implications, it raised the possibility of performing sentinel node biopsy (SNB) in this cohort of patients.

~ In our unit we have commenced the combined procedure of SLNB and targeted lymph node dissection after wire localization. The abnormal lymph nodes need to be marked prior to commencement of NAC.

Further Direction

~ The North American Alliance 11202 trial is examining breast cancer recurrence-free interval in patients with positive sentinel lymph node(s) after completion of neoadjuvant chemotherapy.

~ The trial is evaluating whether radiation to the undissected axilla and regional lymph nodes is not inferior to axillary lymph node dissection with radiation to the regional lymph nodes (but not to the dissected axilla).

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Poster 27: Is it possible to predict non sentinel lymph node positivity on the basis of mRNA copy numbers of CK19 receptor in breast cancer?

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Introduction:

- Sentinel lymph node (SLN) biopsy is the standard of care for axillary assessment of clinically node negative operative breast cancer.
- One step nucleic acid amplification (OSNA) has found wide acceptance as a tool for intraoperative assessment of the sentinel lymph node.

OSNA (One-Step Nucleic Acid Amplification)-

This is a semiquantitative assay based on quantification of mRNA copy numbers of cytokeratin 19 (CK19) receptor. (Figure 1)
- Intraoperative analysis
- Cytokeratin 19 (CK19) mRNA
- epithelial cell marker

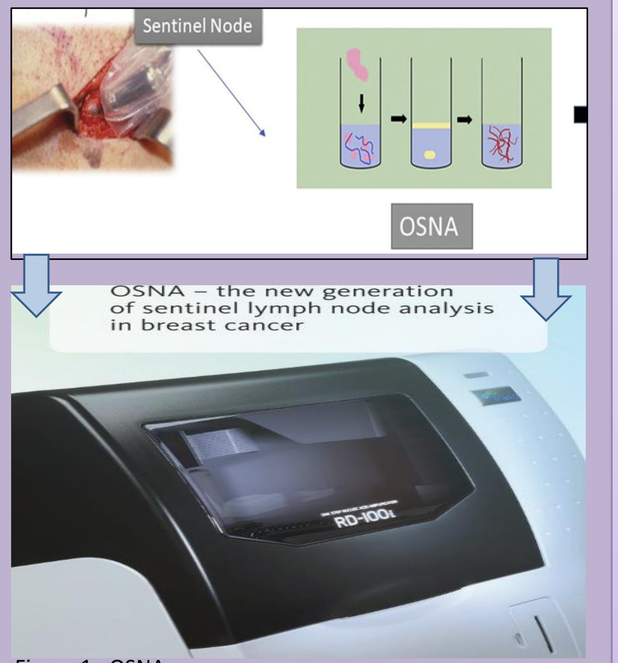


Figure 1 : OSNA

Advantages-

- Prompt results
- Automated and standardised test procedure
- Sensitivity and specificity
- Avoids second operation

Disadvantages:

- Low positive predictive value
- 21 % macro metastases using OSNA but not histology.

Aims:

- To determine if there is any correlation between the number of positive non sentinel lymph nodes (NSLN) and the mRNA copy numbers of cytokeratin 19 (CK19) receptor on one step nucleic acid amplification (OSNA) in the sentinel lymph node (SLN).

Methods:

A retrospective study of consecutive patients who had primary surgery and sentinel node biopsy for breast cancer from January 2011 to December 2018 was carried out.

Interpretation- (copies/µL)- Figure 2
- Negative : < 250
- Micrometastasis : 250-5000
- Macrometastasis : >5000

-mRNA copy numbers of >5000 cytokeratin 19 / µL was considered as macromets and these underwent axillary lymph node dissection (ALND).

Results

- Patients = 1159
- SLNs = 1324
- NSLNs = 2405
- OSNA positive and ALND- 184 (13%)

The mean mRNA copy numbers respectively for the two groups were 609,855 and 853,665.

Out of those with axillary clearance –

Positive NSLNs -105(57%) :
- ❑- single node positivity (P1) = 42%
- ❑- two nodes (P2) positivity= 19%
- ❑- ≥3 nodes (P3+) = 44%.

- Negative NSLNs (P0) - 43%

The two-tailed P value equals 0.8296.
- By conventional criteria, this difference is considered to be not statically significant.

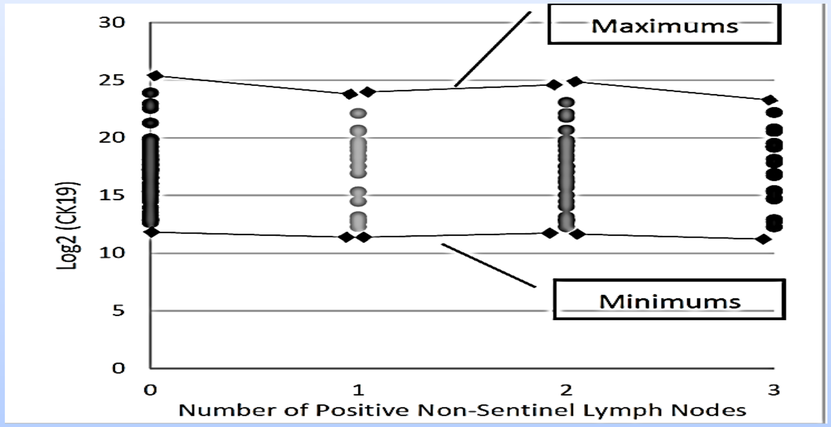
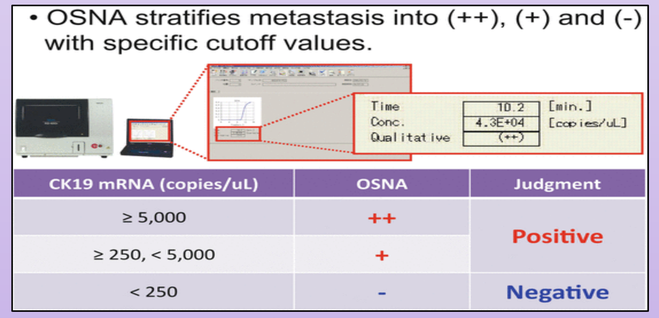


Figure 1: The scatter plot diagram shows the $\log_2$ of mRNA copy number (CK19) for the data set grouped into four categories according to the number of positive non-sentinel lymph nodes: P0, P1, P2, P3+



CK19 mRNA (copies/uL)	OSNA	Judgment
≥ 5,000	++	Positive
≥ 250, < 5,000	+	
< 250	-	Negative

Figure 2 : Interpretation of OSNA results

Conclusion:

It is clear that there is no correlation between mRNA copy numbers and NSLN positivity. We therefore cannot rely solely on the mRNA copy numbers to decide on ALND.

There is therefore a need for a nomogram to predict which of the non-sentinel lymph nodes has disease and avoid ALND in low risk patients.

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Poster 28: Measurement of spiculated malignant lesions on mammogram-do we include the length of the spicules?

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INTRODUCTION

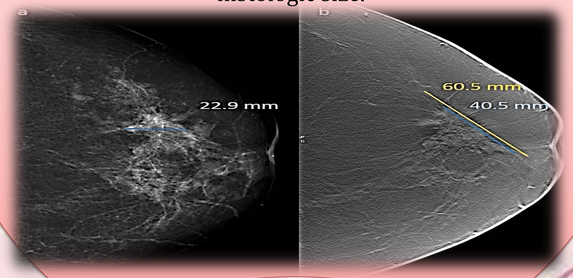
The size of a malignant breast lump pre-operatively is important to decide between mastectomy and breast conserving surgery.

There are no recent studies to determine what is the optimal way to measure spiculated* malignant lesions on mammogram which are histologically invasive ductal carcinoma (IDC).

*A spiculated mass is formed by a dense centre from which arise multiple linear prolongations called spicules

AIM

Determine if the core size or size with spicules has better co-relation with the final histologic size.



METHOD

Duration of study- 48 months from January 2014 to December 2017.

- Only invasive ductal carcinoma was included in the study since patients with invasive lobular carcinomas have MRI for assessment.
- The mammographic size of the spiculated lesions was measured by a Consultant Breast radiologist.
- Pearson correlation co-efficient (R) was used to find the correlation between core size, size with spicules and final histological size.

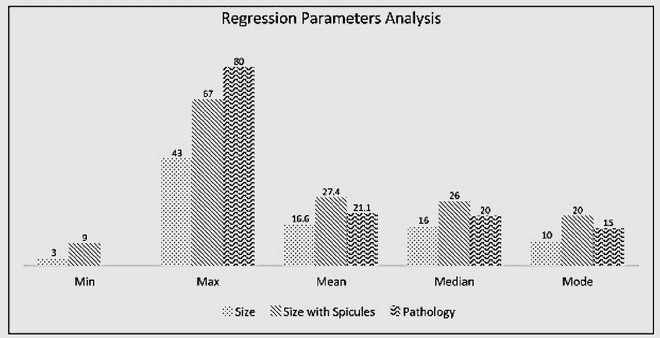


Figure 1

The mean, median, mode and range of the parameters are displayed in figure 1.

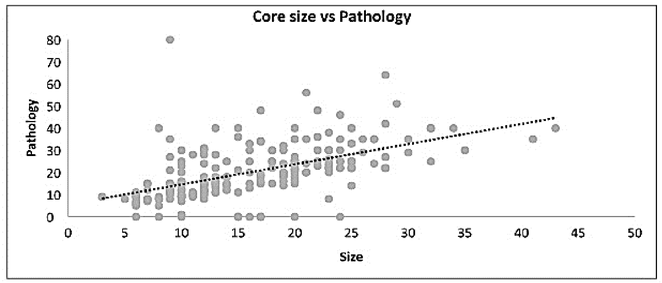


Figure 2.

A correlation analysis of core size versus final histological size the Pearson number (R) is displayed in Figure 2

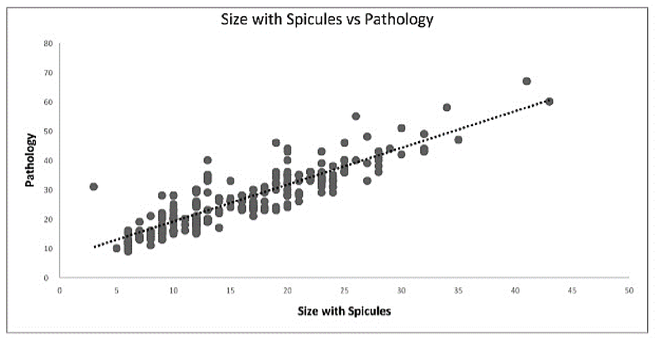


Figure 3.

The Pearson number for size with spicules versus final histological size is displayed in Figure 3

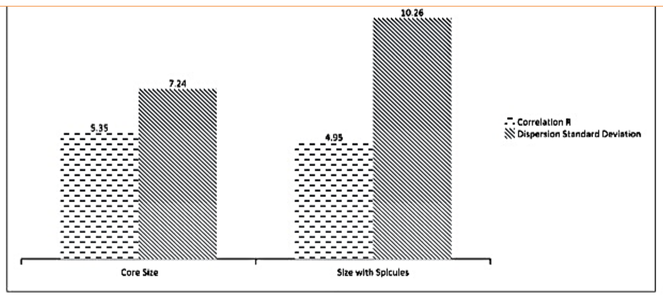


Figure 4.

Both R numbers are compared in figure 4.

RESULTS

- Cohort - 195 patients.
- Age range - 33 to 82 years (mean 70 years)
- Mean of –core size :16.6 mm
  size with spicules : 27.4mm
  final histologic : 21.1 mm. (fig.1)

Using unpaired Student 't' test difference in the means was statistically significant (p<0.0001)

- Pearson number (R)-

- core size versus final histologic size was 0.535 (P-value <0.001)
- size with spicules versus final histologic size was 0.495(P-value <0.001).

CONCLUSION

Our study demonstrated that the core size has a stronger positive correlation to final histological size and should therefore be used pre-operatively in decision making about surgery.

LIMITATIONS

- The selected mammograms were read manually by a single radiologist
- Only invasive ductal carcinomas were included

REFERENCE

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Masses in mammography: what are the underlying anatomopathological lesions?

Berment H; Becette V; Mohallem M; Ferreira F; Chérel P

Diagnostic and interventional imaging; Feb 2014; vol. 95 (no. 2);

Model-based detection of spiculated lesions in mammograms;
Zwiggelaar R; Parr TC; Schumm JE; Hutt IW; Taylor CJ et al;
Medical image analysis; Mar 1999; vol. 3 (no. 1); p. 39-62

Computer-assisted diagnosis in mammography: the R2 ImageChecker System in detection of spiculated lesions].
Funovics M; Schamp S; Lackner B; Wunderbaldinger P; Lechner G et al;Wiener medizinische Wochenschrift (1946); 1998; vol. 148

(no. 14); p. 321-324

Poster 33: Characterising the Role of Hyaluronic Acid Receptor 'HMMR' in Regulating Neuroblastoma Cell Growth and Survival

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Introduction / Background

Recent work conducted by the Stoker team (GOSH Institute of Child Health) exploring the effects of broad tyrosine phosphatase inhibitors on neuroblastoma (NB) cell growth and survival has highlighted a gene of interest, *HMMR*, whose overexpression has been linked to poorer prognosis in neuroblastoma – a condition which remains a complex oncological challenge in young children. The Hyaluronic Acid-Mediated Motility Receptor (HMMR) is a key hyaluronic acid receptor and strongly implicated in driving tumourigenesis in several tumour types through its interface with key signalling molecules - including Hyaluronic Acid (HA) and Aurora Kinase A (AURKA) *(Figure 1 and ref.1)* - however its role in promoting oncogenic progression in neuroblastoma has not yet been investigated.

Objectives: To test for the dependency of NB cells on HMMR signalling through its proposed signalling pathways, we first treated cell lines LAN-1, SK-N-DZ and KELLY with HA synthase inhibitor '4-Methylumbelliferone' (4MU). We then assessed whether 4MU could synergise with a downstream effector for HMMR – Aurora Kinase A – and thus carried out synergy assays with the HA synthase inhibitor in combination with an Aurora Kinase A inhibitor, CD532.

HMMR – A Novel Therapeutic Target?

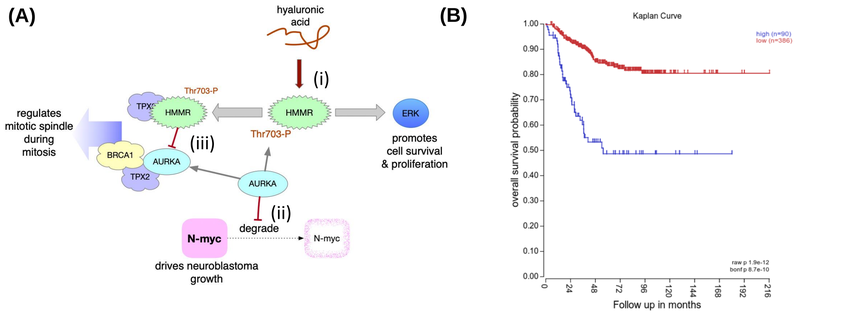

Figure 1: A, Proposed Signalling Pathways through HMMR. (i) Interaction with Hyaluronic Acid (HA), **(ii)** Mediating AURKA-dependent MYCN degradation and **(iii)** Mediating AURKA-dependent G2/M cell-cycle progression *(ref.1).* **B, R2 Prognostics Platform Data for HMMR.** Kaplan-Meier estimate for overall survival probability in neuroblastoma patients with high HMMR expression *(blue curve)* vs. low HMMR expression *(red curve)* reveals that patients expressing high levels of HMMR have a significantly lower overall survival probability *(from: R2 platform, https://hgserver1.amc.nl/cgi-bin/r2/main.cgi).*

AIM I: Sensitivity of NB Cell Lines to HA Synthase Inhibitor, 4MU

AIM I: Evaluate the Role of Hyaluronic Acid Signalling in Mediating Neuroblastoma Cell Growth and Survival by Assessing Relative Sensitivity of NB Cell Lines LAN-1, SK-N-DZ and KELLY to the **HA Synthase (HAS) Inhibitor**, '4-Methylumbelliferone' (4MU), a drug used in bile therapy.

METHOD: A dilution series of 4MU from 1mM downwards was set up in triplicate on 96-well plates of each neuroblastoma cell type (SK-N-DZ, LAN-1 & KELLY) and treatment was for six days. Fluorescence values (indicating relative cell viability) were derived via resazurin, and the mean of triplicate experiments at each concentration was calculated and graphed.

RESULTS: All three neuroblastoma cell lines displayed sensitivity to the HAS inhibitor 4MU, with cell viability being inhibited in a dose-dependent manner. Estimated EC_{50} values range from 0.125mM to 1.0mM **(Figure 2).**

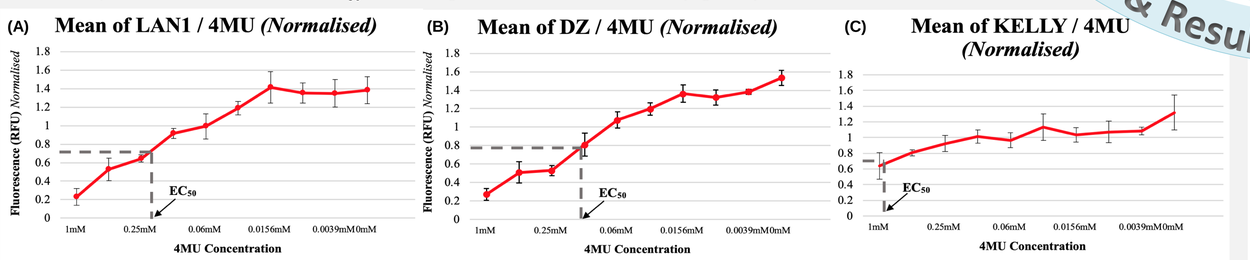

Figure 2: Effect of 4MU concentration on (A) LAN-1, (B) SK-N-DZ and (C) KELLY cell viability. Data represents the mean ± SD of three / four independent assays (normalised).

HA-Mediated Motility Receptor • AIM I: Methods & Results • AIM II: Methods & Results • AIM III: Methods & Results

CONCLUSIONS

1. We show, for the first time, that LAN-1, SK-N-DZ and KELLY neuroblastoma cell lines display a **dependency upon Hyaluronic Acid signalling for survival**; this highlights the possible significance of the HA-HMMR axis, and indicates that 4MU could potentially be used as a **novel therapeutic lead against NB.**

2. We have also produced data that evidence **drug interactions between 4MU and AKI in neuroblastoma cell lines** - a novel observation that could point towards a functional interaction between AURKA and HMMR in promoting cell growth and survival. *This is of great interest to explore further, since neuroblastoma is a heterogeneous tumour and should be more vulnerable to dual therapies targeting several tumourigenic pathways.*

AIM II: Sensitivity of NB Cell Lines to Aurora Kinase A Inhibitor (AKI)

AIM II Evaluate the Role of Aurora Kinase A in Mediating Neuroblastoma Cell Growth and Survival by Assessing Relative Sensitivity of NB Cell Lines to an **Aurora Kinase A Inhibitor (CD532).**

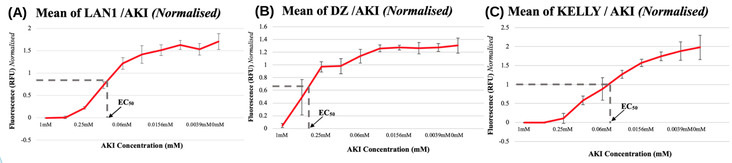

Figure 3: Effect of AKI concentration on (A) LAN-1, (B) SK-N-DZ and (C) KELLY cell viability. Data represents the mean ± SD of three / four independent assays (normalised).

METHOD: The set-up and analysis of this assay is parallel to that described for Aim I, with Aurora Kinase A inhibitor CD532 used in place of 4MU. Treatments were for six days before resazurin assays.

RESULTS: All three neuroblastoma cell lines displayed sensitivity to AKI inhibition and cell viability was inhibited in a dose-dependent manner. Estimated EC_{50} values range from 0.06mM to 0.125mM **(Figure 3)**.

AIM III: Combinatorial Effects of 4MU and AKI

AIM III Evaluate whether any **combinatorial effects** (synergy/antagonism) exist between 4MU and AKI, and to subsequently suggest whether the actions of HMMR and AURKA are interlinked.

METHOD: A bi-directional gradient of 4MU and AKI was set up (from 1mM downwards and 0.5mM downwards respectively) in a 6x6 array and assayed via resazurin after 6 days. To analyse the combinatorial effects of AKI/4MU, the web application 'SynergyFinder' was used; dose-response data was compared against two reference models - Zero Interaction Potency (ZIP) and the BLISS Independence Model - to generate 2-D and 3-D synergy maps **(Figure 4).**

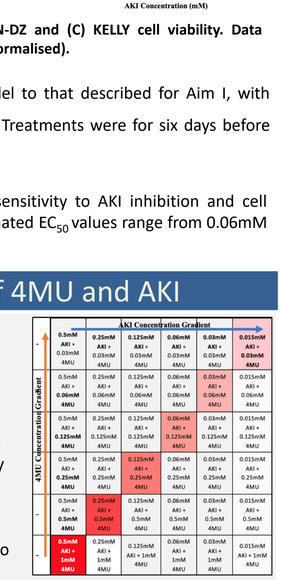

Figure 4: 96-well plate set-up for 4MU/AKI bi-directional drug gradient.

RESULTS: LAN-1 (A) and SK-N-DZ (B) produced a pattern of **synergy** (red) across a range of drug doses, whereas KELLY (C) was more complex, with regions of synergy (red) **and antagonism** (green) depending on the dose of AKI **(Figure 5)**.

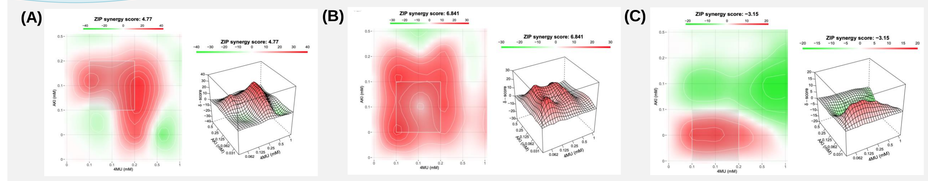

Figure 5: 2D and 3D Synergy plots of LAN-1 (A), SK-N-DZ (B) and KELLY (C) data, generated using the ZIP reference model. Areas of synergy are highlighted in red, and antagonism in green. Graphs generated through the BLISS independence model displayed similar patterns of synergy and antagonism (not shown).

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Poster 47: Changes in the use of laparoscopic surgery for colorectal cancer in a university teaching hospital

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[1]Cardiff University Medical School, [2]University Hospital of Wales

2020 BASO Annual (virtual) Meeting
21st – 23rd Nov

Introduction / Background

Colorectal cancer (CRC) is the fourth most common cancer in the UK(1). Treatment is usually surgical resection either by laparotomy or laparoscopy.

Laparoscopic surgery (LS) for CRC was first approved for use in the UK in 2006(2) and was rapidly adopted on the basis of proposed equivalence in survival outcomes, reduced morbidity, shorter hospital stays, faster recovery(3-5) and cost efficiency(6) when compared to open surgery (OS).

However, it may not be appropriate in certain patients. There remains controversy as to longer term outcomes, adequacy of resection margins and lymph node harvesting(7), and the bias inherent in selecting certain patient groups as suitable for minimally invasive approaches.

Wales in particular sees over 50% of bowel cancers presenting at more advanced stages, or in emergency circumstances, for which laparoscopic approaches may not be suitable.

Objectives

The purpose of this study was to:

- Examine changes in approaches for CRC surgery in Wales' tertiary centre in the elective and emergency setting.
- Determine the reasons for the approach in both the elective and emergency setting.
- Determine the reasons for conversion to OS in both the elective and emergency setting.

Methods and Materials

All CRC patients (n=2118) were identified from the national bowel cancer audit database from 2011-2018.

The following exclusion criteria were applied:

- No surgical intervention
- Endoscopic removal of tumour
- Transanal Endoscopic Microsurgery (TEM)
- Procedure did not involve resection
- Patient <16 years old at time of surgery
- No data/insufficient data

1154 patients remained after the exclusion criteria were applied.

Retrospective case analysis determined patient demographics, nature of operation and reasoning for conversion or open surgery.
Chi-squared test was utilised for categorical variables, with significance at $p<0.05$.

Results

- Of 2,118 total CRC cases analysed, 1,154 underwent operation (54.5%), with 676 (31.9%) deemed not suitable for operation at diagnosis.
- 242 (11.4%) had a more minor procedure such as endoscopic resection.
- The proportion of minor procedures increased over time, as did the proportion of attempted laparoscopic resections, from 53.7% in 2011 to 78.2% (66.0% completed plus 12.2% converted) in 2018.
- By 2018 only 10.6% of elective CRC operations were open.
- The main reasons for open elective surgery were tumour size/location, and in the emergency setting logistics for available staff and equipment resulted in an open approach.
- Emergency laparoscopic operations have increased from 10.0% of emergency operations in 2011, to 36.4% in 2018.
- Conversion rates were higher in the emergency setting (33.3%-48.1%) compared to elective (18.2%-19.4%), with main reasons for conversion being adhesions and failure to progress.

Table 1. Initial surgery approach

	All resected surgeries		Elective surgeries		Emergency Surgeries	
	Laparoscopic	Open	Laparoscopic	Open	Laparoscopic	Open
2011	53.7%	46.3%	68.1%	31.9%	10.0%	90.0%
2012	56.9%	43.2%	69.2%	30.8%	6.90%	93.1%
2013	60.0%	40.0%	73.8%	26.2%	8.82%	91.2%
2014	61.5%	38.5%	73.8%	26.2%	10.3%	89.7%
2015	73.1%	26.9%	84.3%	15.7%	18.2%	81.8%
2016	77.4%	22.6%	92.4%	7.6%	28.1%	71.9%
2017	68.5%	31.5%	82.9%	17.1%	18.8%	81.2%
2018	78.2%	21.8%	89.4%	10.6%	36.4%	63.6%

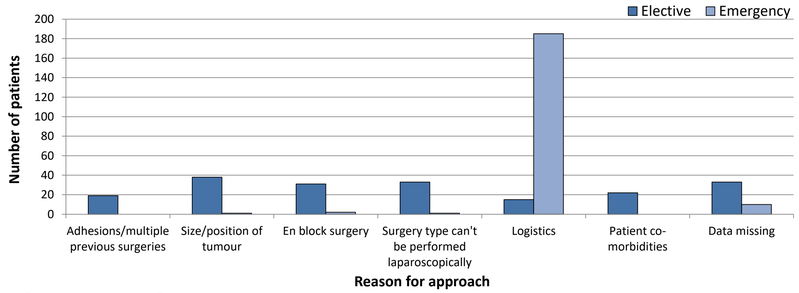

Chart 1. Reasons for primary open surgery

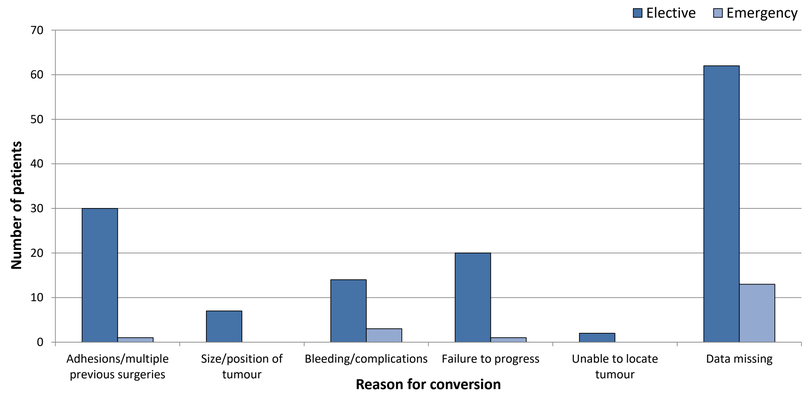

Chart 2. Reasons for conversion

Discussion

This centre performs above national average LS for CRC with increasing use in both emergency and elective settings. By 2018 the attempted LS rate in all settings for our centre was 78.2% (66.00% completed plus 12.2% converted) compared to the national average for 2017-18 of 69% (61% completed plus 8% converted)(8).

The proportion of laparoscopic resections is high, despite our centre seeing over 50% of bowel cancers present at more advanced stages, or in emergency circumstances where laparoscopic approaches may not be suitable.

Conversion to open surgery rates have fallen as laparoscopic equipment, training and techniques have improved. Specialist Registrars in Wales have completed the Welsh Laparoscopic Colorectal Training Scheme (WLCTS)(9) which has contributed to the increase in proportion of LS.

The trend toward dual upper and lower gastrointestinal consultant on call means a colorectal laparoscopic specialist is available to undertake emergency laparoscopic work.

The elective attempted LS rate by 2018 of 89.4% is just short of the 90% that Buchanan et al. estimated could feasibly be achieved(10), reflecting the increase in skill and experience within our centre.

Conclusion

LS for CRC has increased over time, in both elective and emergency cases. However emergency LS is still logistically difficult to perform.

Contact

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Poster 53: Is Routine Group and Save Screening Necessary Prior to Elective Breast Cancer Surgery?

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2020 BASO Annual (virtual) Meeting
21st – 23rd Nov

Background and Objectives

- Patients undergoing elective breast cancer surgery very rarely require blood transfusion.
- Currently, there are no standardised national guidelines regarding pre-operative blood group sampling for patients undergoing elective breast cancer surgery.
- Performing group and save (G&S) samples may also be labour intensive and expensive.
- This study aims to assess the necessity of G&S samples before elective breast cancer surgery by identifying rates of post-operative transfusion.

Methods and Materials

- Retrospective data collection
- All elective breast cancer surgery performed at a single district general hospital between March 2017 and March 2020.
- All elective breast cancer surgery cases were included, namely mastectomies, wide local excisions (WLE), and cavity wall excisions.
- Records were reviewed to ascertain whether blood G&S samples were performed pre-operatively, as well as blood transfusion data for each patient.

Discussion

- The rate of post-operative transfusion in elective breast cancer surgery is evidently very low.
- Need for routine G&S samples for elective breast cancer surgery is currently assessed based on individual clinicians' decisions.
- 136 samples were taken overall which did not lead to eventual need for cross-match, costing £3.29 per sample at our institution.
- The vast majority of patients in our series have low risk of post-operative bleeding, and therefore routine group and save was arguably not necessary.
- The commonest reason for post-operative transfusion is haematomas, for which there is often still time to perform group and save samples for cross-matching if required, and if not, O negative blood should be made available in the event of a clinical emergency.

Results

- Of 154 patients identified, median age was 60(range 35 to 97) years.
- 39(25.3%) patients underwent mastectomy, 104(67.5%) patients underwent WLE, and 11(7.1%) patients underwent cavity wall excision. No patients underwent immediate reconstruction procedures afterwards.
- Only 61(39.6%) patients had valid first and second G&S samples on the system (Figure 1)
- Only 2(1.3%) patients received transfusion post-operatively, both were due to post-operative haematomas (Figure 2). Of these 2 patients, one underwent bilateral mastectomies, and the other underwent WLE for a 3cm inner upper quadrant tumour. Both of these patients had both pre-operative G&S samples.
- 12 blood units were ordered within a 3 year period which were subsequently not used. Performing group and save samples on morning of surgery had led to delay in 12(7.8%) cases, which were subsequently not required for cross-match post-operatively.

Figure 1. Proportion of patients with two valid G&S samples

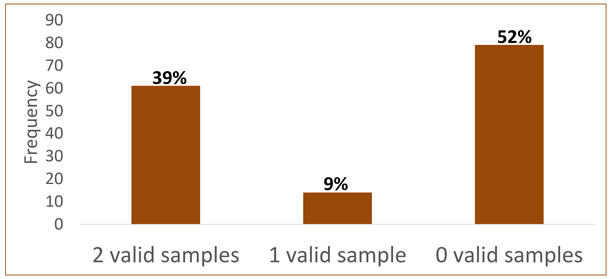
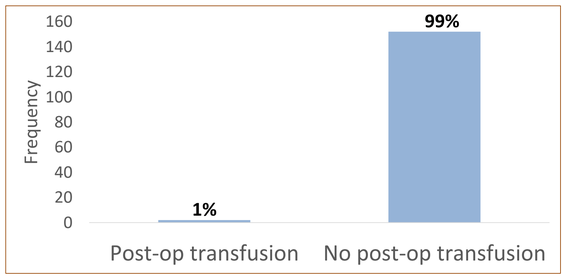


Figure 2. Proportion of patients requiring post-op transfusion



Conclusions

- Routine group and save samples of all patients undergoing elective breast cancer surgery is unnecessary.
- We propose that a patient specific and targeted approach to assess requirement for pre-operative G&S. This may reduce healthcare funding pressures, reduce unnecessary jobs for junior doctors, and reduce risk of delay to surgery.

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Poster 59: Patient outcomes following surgical management of thyroid nodules classified as Bethesda category III (AUS/FLUS)

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[1]General University Hospital of Patras

BASO Annual (virtual) Conference
21st -23rd Nov 2020

Introduction

The Bethesda classification system for reporting thyroid cytopathology is the standard for interpreting fine needle aspirate (FNA). Because of its heterogeneity and inconsistent reporting, atypia of undetermined significance or follicular lesion of undetermined significance (AUS/FLUS), known as Bethesda category III, is the most controversial category. Thyroid nodules that fall within Bethesda categories III-IV have an overall risk of malignancy of between 15-40%. The aim of this study was to determine the malignancy rate in Bethesda III nodules.

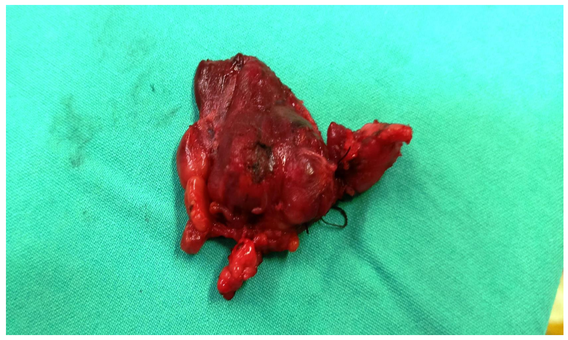

Figure 1. Specimen of a 44-year old patient who underwent thyroidectomy for Bethesda III nodule.

Methods and Materials

A retrospective study was performed for 1166 patients who underwent thyroid surgery for multinodular goiter (MNG) or solitary nodular goiter (SNG) in our institution between June 2010 and May 2020. Data retrieved included demographic characteristics of the patients, FNB cytology, thyroid function test results, type of thyroidectomy and final histology results.

Results

During the study period, 29.5% (344/1166) of patients with an FNA categorized as AUS/FLUS underwent thyroid surgery. Of these 344 patients, 190 were diagnosed with MNG and 154 with SNG. Incidental malignancy was found in 35 of 190 cases of MNG (18.42%) and 31 of 154 cases of SNG (20.13%).The most common malignant tumor type in either category was the follicular variant of papillary thyroid carcinoma.

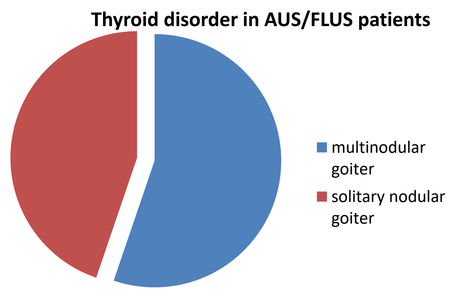

Chart 1. Thyroid disorders of 344 patients with an FNA categorized as AUS/FLUS who underwent thyroidectomy.

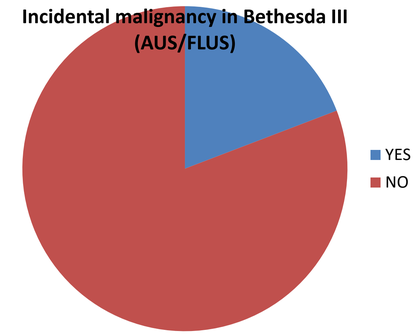

Chart 2. Malignancy found in 66 out of 344 patients with FNA categorized as Bethesda III (AUS/FLUS)

Discussion

Out of 344 patients with FNA categorized as Bethesda III who underwent thyroidectomy, malignancy was found in only 66 cases (19.2%). Atypia of undetermined significance (AUS)/follicular lesion of undetermined significance (FLUS) in thyroid fine needle aspiration (FNA) is a challenging category. The risk for malignancy is different by multiple factors and subsequent management strategy is inconclusive.

Conclusion

The current study demonstrates that patients with an FNA categorized as AUS/FLUS may have a higher risk of malignancy than traditionally believed. Reconsideration may be necessary to guidelines that recommend observation or repeat FNA in this category of patients.

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POSTER 78. DEVELOPING A SET OF QUALITY INDICATORS (QPIS) FOR METASTATIC BONE DISEASE (MBD) – WHAT IS BASIC CARE?

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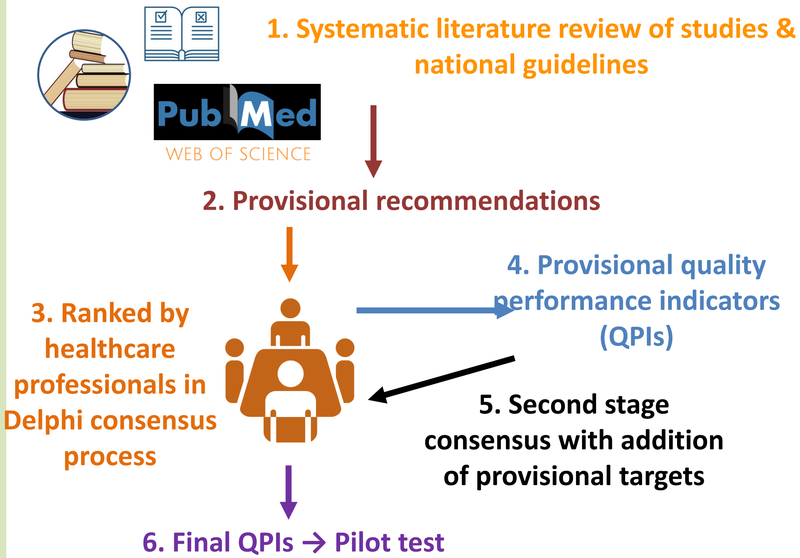
2020 BASO Annual (virtual) Meeting
21st – 23rd Nov

BACKGROUND

Patients with metastatic bone disease (MBD) should receive the same standard of care regardless of which centre they are treated in[1,2].

The aim was to develop and test a set of quality performance indicators (QPIs) to evaluate care for MBD patients referred to orthopaedics[3].

METHODS



TAKE HOME MESSAGES

- MBD patients should receive a minimally acceptable standard of care regardless of where they present but there is no validated way to assess this
- We have developed a novel set of QPIs with expert consensus and validated these in a retrospective cohort
- These QPIs can be used to assess care across different centres but should be validated with markers of good outcome including PROMs

RESULTS

- 2568 articles including 4 guidelines were reviewed.
- 43 provisional recommendations were extracted, 40 proceeded to expert consensus
- After two rounds, 18 quality performance indicators (QPIs) for MBD care were generated:

1. Impending #s: urgent ortho review	2. Imaging completed without delay	3. Treatment decision made without delay	4. Solitary lesion: full pre-op work-up inc. biopsy	5. Impending fractures should be discussed with oncology	6. Pre-op work-up should include up-to-date blood tests
75% inpatients seen by ortho within 48h	75% requiring imaging have this completed within 7 days	80% have decision made within 48h of referral/ imaging	70% have further imaging or doc. of reason not	60% should have oncology input before surgery	85% have complete bloods within 48 hours of surgery

7. Documented pre and post-op pain assessment	8. Patients with fractures have surgery without delay	9. Start rehab within 72h of surgery	10. Post-op plan includes FU & weight-bearing	11. Clinic FU: doc. of # union & metalwork status
85% have pre and post-op pain documented	80% should have surgery within 7 days of decision to operate	75% have PT input by Day 3 post-op	75% have post-op plan with FU & WB status	65% have full xray review at follow-up

12. Dying patients: recognised & documented	13. Dying patients: input from palliative care	14. Dying patients: plan for ceiling of care and CPR
65% patients recognised as 'dying / frail'	65% patients have palliative care during admission	65% patients have DNA CPR status documented

15. MDT discussion for complex cases	16. Patients managed via MBD care pathway	17. Education provided for MBD team members	18. MBD outcomes data collected & audited
Yes / no	Yes / no	Yes / no	Yes / no

RESULTS 2

In the pilot test, targets were met for 5/18 QPIs (mean 52%, STD 22%). The median deviation from projected target was -14% (IQR -11% to -31%, range -74% to 11%).
The highest scoring QPI was "Adults with fractures should have surgery within 7 days" (target 80%:actual 91.5%).

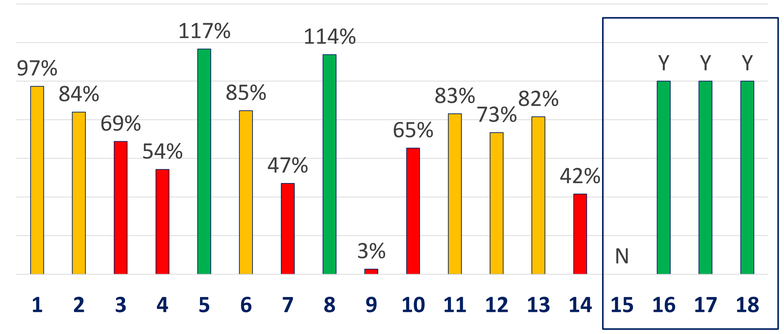


Figure 1. Percentage score in relation to individual target for each of the 18 quality performance indicators (QPIs)
E.g., QPI 5 had a target of 60% and an actual score of 70%, generating a percentage score of 117%. The last four QPIs are systemic targets (e.g. presence/absence of MBD care pathway) so have a binary outcome of Y/N

DISCUSSION & FUTURE WORK

The published evidence and guidelines were adapted into a set of validated quality performance indicators (QPIs) for MBD care which can be used to evaluate variation in care between centres. These QPIs should be correlated with patient-reported outcome scores to determine whether they can act as predictors of outcome after surgery.

We are planning a UK multi-centre validation study (6 sites confirmed so far, please contact the author below if you would like your site to participate) with a target sample size of 142/site (to detect a 5% difference in combined mean QPI score).

This will allow us to validate the power of this novel set of QPIs in detecting differences in basic care for MBD patients between UK orthopaedic centres.

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THANKS TO:

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PhD supervisors

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Poster 91: Anal Intraepithelial Neoplasia (AIN): a 13-year experience

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2020 BASO Annual (virtual) Meeting
21st – 23rd Nov

Introduction

Anal intraepithelial neoplasia (AIN) is a precursor lesion to squamous cell carcinoma (SCC) of the anus with a reported prevalence in the population of <1%. AIN is graded from 1-3 in-terms of degree of dysplasia, where AIN3 is the most dysplastic precursor lesion.

Currently a process of surveillance is required to pick up early progression to invasive malignancy. There are no large cohort studies assessing transformation from AIN 3 to anal cancer. We present our 13-year experience with this condition.

Methods and Materials

A retrospective review of patients with histology demonstrating AIN 3 at a single tertiary centre over a 13-year period was performed. AIN1 or 2 patients were excluded.

Demographics, clinicopathological features, previous history of malignancy, progression to anal cancer, treatment and mortality were recorded and analysed.

Table 1

	Totals
Gender	**N (%)**
Male	26 (38.2)
Female	42 (61.8)
Smoking History	**N (%)**
Current	25 (36.8)
Ex-Smoker	15 (22.0)
Never smoked	13 (19.1)
Unknown	15 (22.0)
Clinical Presentation	**N (%)**
Anal warts	8 (11.8)
Other lesion	16 (23.5)
Symptomatic – bleeding/pain	10 (14.7)
Abnormal DRE	3 (4.4)
Incidental	15 (22.1)
Incidental (previous anal cancer)	1 (1.5)
Suspected anal cancer	8 (11.8)
Previous CIN/VIN	5 (7.4)
Unknown	2 (2.9)
Original Histology	**N (%)**
AIN3 alone	40 (58.8)
AIN3 + CIS/T1 microinvasion	8(11.8)
AIN3 + anal SCC >T1	20 (29.4)
Age	**Median (range)**
	55.5 (20-82)
Male Cohort	**N=26**
HIV Positive	10 (38.5)
MSM	9 (34.6)
Female Cohort	**N=42**
Previous CIN/VIN	3 (7.1)
HIV Positive	1 (2.4)

Results

A total of sixty-eight patients were identified with histological confirmed AIN3. Median follow up was 50.5 months (range 0-252). Patients within this cohort were assessed for their original date of presentation ranging over 20years (1999-2019). Demographics are summarised in *table 1*.

Twelve (17.6%) patients had a previous history of malignancy, 2 (2.9%) were systemically immunosuppressed, 14 (20.6%) had a history of anal warts and 27 (39.7%) had confirmed HPV infection.

Of the 40 patients who presented with AIN3 alone at initial histology, 7 (17.5%) progressed to SCC at a mean of 20.2 months (range 1-66) from initial histology. Thirty-five patients presented with anal cancer; where 8 had microinvasion and 20 were invasive anal cancer at presentation. For treatment, 11 patients underwent local excision, 22 underwent chemoradiotherapy, of which 1 went on to require salvage surgery. One patient declined treatment and one was palliated only.

Subgroup analysis demonstrated progression from AIN3 to SCC in 35.7% of those with proven HPV, 60% of those with anal warts, 45.4% of those with HIV, 41.2% of those with CIN or VIN, 53.8% of those with previous malignancy, 44.4% of those practicing MSM and 45% of those who were active or ex-smokers.

59 (86.8%) of patients were alive at the time of review. Of the 9 (13.2%) that died, 3 died from metastatic anal SCC, 1 died from infected sacral pressure sores following radiotherapy for anal SCC, and 5 from other causes.

Conclusions

We present a large series of AIN3 with and without malignant transformation. Risk factors are important to identifying at risk population groups. However, factors predicting development of malignant transformation are still to be clearly identified.

Optimum surveillance strategies for these patients remains debatable. Since approximately 25% of these AIN3 patients were diagnosed on incidental histology after surgery for other indications, it is recommended that all perianal specimens must be assessed by a pathologist.

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Poster No 96 : Do we still need to do dual tracer localisation for sentinel node biopsy in patients with early breast cancer?

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BASO~ACS

2020 BASO Annual (virtual) Meeting
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Introduction / Background

Dual tracer i.e. isotope injection and blue dye, is the gold standard for sentinel node localsiation[1]. During COVID-19 pandemic the breast cancer services, and practice changed significantly to minimise the exposure of patients or staff to COVID-19. Association of Breast Surgery UK, in March 2020, recommended use of single tracer(radio-isotope), instead of the dual tracer technique[2]. This was recommended to avoid the small risk of anaphylaxis associated with blue dye, requiring ventilator support and thus straining the already overwhelmed ITUs.

Objectives

We compared sentinel node identification rate, using single tracer (radio-isotope) during "COVID-19 time", with Pre-COVID dual (blue dye plus radio-isotope) localisation.

Methods and Materials

The study sample comprised of all the sentinel lymph node biopsy(SLNB) procedure done for breast cancer ,within 3 months (15 March 2020 to 15 June 2020). Data regarding type of tracer, sentinel node identification was collected, using clinical and electronic record.

Results

- 43 patients in each group i.e. "dual tracer" and "single tracer" group, total of 86 patients .
- SLNB identification rate was 97.6% (42/43) for single tracer radio-isotope localisation.
- SLNB identification rate was 100% (43/43) for dual tracer .
- P value for the difference >0.05(Chi-squared test).

	Sentinel node identified (YES)	Sentinel node identified (NO)
Dual Tracer Localisation	**43**	**0**
Radiotracer Localisation	**42**	**1**

Discussion

- Several tracing methods for SLNB have evolved over time, including radioisotope technetium-99m sulfur colloid (^{99m}Tc)[1], blue dye[1], indocyanine green fluorescence,[3,4], magnetic tracer,[5] and carbon nanoparticles[6].
- Dual tracer technique, remains the gold standard due to high identification rate and low false negative rate.
- Many experienced surgeons across the UK, prefer to avoid the blue dye, due to unsightly tattooing, staining of tissues and surgical planes and allergic reaction/anaphylaxis.
- Apart from high identification rate, the visualization of the node, helps in training and teaching of junior surgeons.
- Our experience with radiotracer localization, during COVID -19 pandemic, has been satisfactory, which is evident by our data and has shown comparable results in both groups.
- The question to answer is ; can we omit blue dye in selected patient, and rely on radioisotope, in "New Normal" or revert back to "gold standard'?

Conclusions

The omission the blue dye for sentinel node localisation should be considered , in view of risk of anaphylaxis ,albeit low, additional bothersome tattooing, cost, and lastly for simplification of procedure. Studies with larger sample size are needed to confirm the non-inferiority of radioisotope localisation.

Contact

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Poster 97 : The challenging B3 breast lesion - A single centre experience of incidence and upgrade rates

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Introduction / Background

- Breast B3 lesions (indeterminate at biopsy) are a significant entity in breast surgery.
- **'Upgrade'** of these lesions mean that on further sampling they are proven to contain premalignant/malignant cells.
- They are further characterised by malignant risk which stratifies variable potential for malignant transformation.
- Traditionally, B3 lesions were managed by surgical excision , the recent **NHS BSP guidelines** recommend VAE for all B3 lesions without atypia.; Excluding Pappilomatous lesions with atypia, cellular fibro epithelial lesions and rarer B3 lesions which require surgical excision. [1]

Objectives

- The aim of this study was to review the incidence of types of lesions in our patient cohort at the **Princess Royal University Hospital (PRUH)** and their upgrade rates.

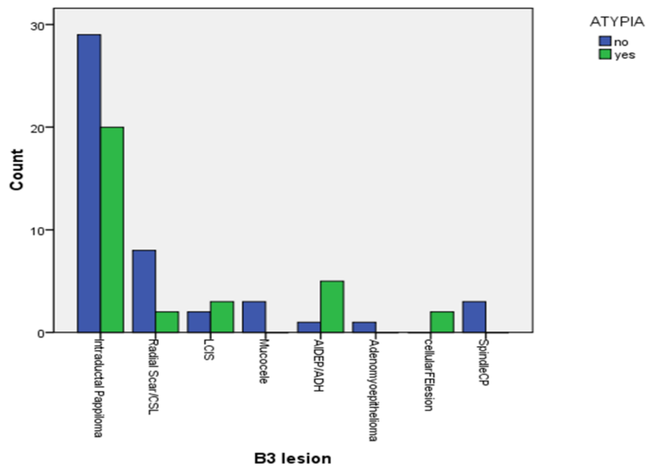


Chart: Atypia in each B3 lesions

Methods and Materials

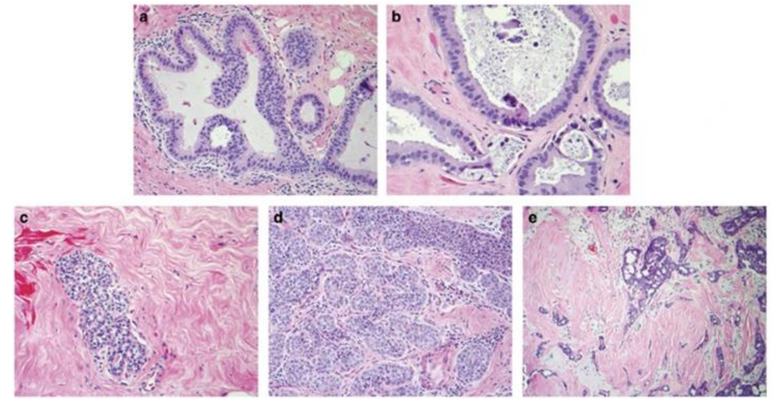
- A retrospective observational study, of patients between **February 2018 and February 2020,** attending PRUH for screening or having breast symptoms, with subsequent triple assessment confirming a B3 lesion.
- Data was collected from the PRUH MDT database and analysed using SPSS 17.0.

Type of B3	Number of cases	Upgraded to B4/B5(% of each B3 type upgraded)
Intraductal Papilloma	49 (62%)	8 (16.3%)
Radial Scar/CSL	10 (12.7%)	1 (10.0%)
AIDEP/ADH	6 (7.6%)	2 (33.3%)
LCIS	5 (6.3%)	1 (20.0%)
Mucocele	3 (3.8%)	0
Spindle Cell Proliferation	3 (3.8%)	0
Cellular Fibro-epithelial lesion	2 (2.5%)	1 (50.0%)
Adenomyoepithelioma	1 (1.3%)	0
Total	79	13

Table: Upgrade rate of each B3 lesion

Results

- 79 patients fulfilled our inclusion criteria, age range (25-89 years)
- 66/79 patients progressed to surgical excision or vacuum assisted excision biopsy of their lesions.
- 13/66 **(16.5%)** were upgraded from B3 to B4/B5 after first biopsy.
- The rate of Atypia amongst all B3 lesions was **40.5%**.



A: Atypical Ductal Hyperplasia
B: Flat Epithelial Atypia
C: Atypical Lobular Hyperplasia
D: Lobular carcinoma *in situ*
E: Radial Scar

Discussion

- The rate of diagnostic surgical excision in our study was 53.16% (n=42/79), which is higher than the expected Key Performance Indicator (<25%) [2].

Conclusions

- The most common lesion in our cohort is the **Intraductal papilloma (49/79)**.
- There is a difference in our B3 lesions incidence, compared to published data although our numbers are relatively small.
- Our overall upgrade rate (16.5%) in comparison to the published average (17.0%) appears to be similar.
- We can reduce the number of surgical excisions performed in preference to VAE (gold standard for majority B3 lesions) if we follow guidelines.

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Poster 103: Undergraduate urology – does this adequately prepare junior doctors?

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2020 BASO Annual (virtual) Meeting
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Introduction

Junior doctors commonly encounter patients with urological issues regardless of the specialty they work in. Previous surveys of newly-qualified doctors have shown a lack of confidence in managing basic urological issues.

Objective

The objective of this project was to assess junior doctors' knowledge and undergraduate experiencing of urological malignancies.

Methods

Junior doctors at our local hospital were invited to complete a questionnaire regarding their undergraduate urology experience and their confidence in assessing patients with urological malignancies. The survey also included an assessment testing their knowledge of urological malignancies. These questions were derived from expected competencies described in the British Association of Urological Surgeons (BAUS) undergraduate syllabus for urology.

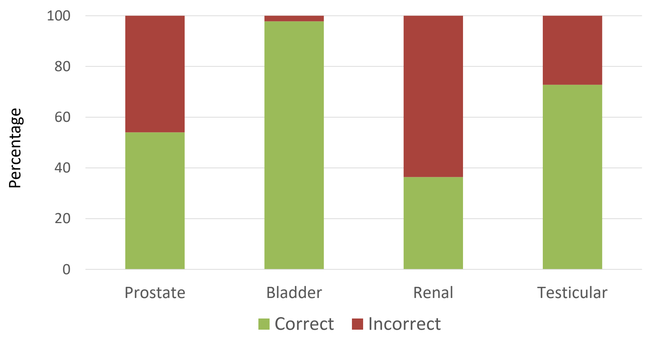

Figure 1. Assessment of basic knowledge of urological malignancies

Results

27 junior doctors from 12 different medical schools responded to the survey. 44.4% reported 1 week or less undergraduate urology experience. Participants correctly answered 54.0%, 97.8%, 36.4% and 72.8% of questions regarding prostate, bladder, renal and testicular cancer respectively (Figure 1). 39.9% correctly answered questions regarding the investigation of urological malignancies.

66.6% of doctors reported feeling 'not so confident' or 'not at all confident' assessing and investigating urological malignancies. 66% of doctors with greater than 4 weeks undergraduate experience described feeling 'somewhat confident' in comparison to only 14% of those with less than 1 week exposure (Figure 2).

Discussion

In 2012, the British Association of Urological Surgeons (BAUS) suggested an undergraduate syllabus for urology[1]. This was prompted by a significant variation in the delivery of undergraduate teaching and lack of confidence of newly qualitied doctors with manging basic urological issues. Despite these recommendations, a study in 2014 reported that 44% of foundation doctors stated they had received no formal undergraduate clinical attachment in urology[2].

From our study, we can see that there is a wide variation in undergraduate urology experience. Duration of undergraduate urology exposure appears to correlate with junior doctor confidence (Figure 2.) No doctor described themselves as extremely or very confident, however increased levels of confidence were recorded in those who had a longer duration of undergraduate urology teaching.

47.6% of respondents felt that their knowledge of urological malignancies was either limited or poor in comparison to the standard expected for their current stage of training.

As well as assessing confidence of junior doctors, we also tested their basic knowledge of urological malignancies. Participants scored well on questions regarding bladder and testicular cancer, however struggled with prostate and renal cancer. They particularly seemed challenged with questions regarding basic investigations of urological malignancies, with an average score of 39.9% answered correctly.

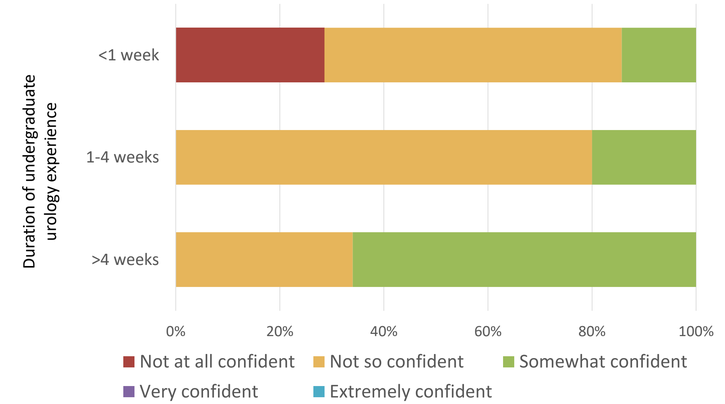

Figure 2. Confidence levels of junior doctors with regards to initial assessment and investigation of urological malignancies

Conclusions

There is a large variation in undergraduate urology experience. We have identified weaknesses in knowledge, particularly regarding renal cancer and investigation of urological malignancies. There is a lack of confidence in assessing and investigating these patients. Further teaching could be a simple yet effective strategy to bridge these gaps; thereby improving understanding, confidence and ultimately will have a positive impact on patient care.

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Poster 104: Upper Gastrointestinal (UGI) Mural Thickening on Computed Tomography (CT) and its Significance in the Multi-Disciplinary Team (MDT) Pathway

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Introduction / Background

- Over the last 10-15 years multi-disciplinary team meetings (MDTs) have become established as the gold standard in the decision-making process for cancer care in the UK.
- MDTs are resource intensive, requiring large amounts of consultant time(1).
- Recent national drives have espoused making MDTs more efficient and minimising unnecessary or duplicate patient discussions (2)(3).
- There are several routes for discussion at oesophago-gastric MDTs, including confirmatory or suspicious histopathology, endoscopy or radiology findings.
- The cancer pick-up rate from the latter (Radiology) is unclear.
- Several small studies demonstrated that abnormal radiology findings were associated with a cancer pick up rate of 12-53%(4)(5)(6).

Objectives

- To determine the cancer pick-up rate at endoscopy and biopsy after MDT referral for suspicious radiologic findings.
- To explore any differences in cancer pick-up rate between different anatomic sites within the upper gastrointestinal tract.
- To correlate the degree of mural gastrointestinal thickening (mm) with subsequent cancer diagnosis.
- To assess the impact of extra-mural findings on subsequent cancer diagnosis.

Methods and Materials

Study design: retrospective cohort study

Setting: University Teaching Hospital

Methodology: review of electronic patient records, investigation reports, MDT records and CT imaging for patients discussed at UGI MDT during the time period 1st April 2014 to 5th February 2016. All CTs were reviewed and depth of mural thickening measured in triplicate by assessors blind to the diagnosis. Where investigator discordance of >10mm was present, consensus measurements were agreed. Cancer staging was assessed using the Union for International Cancer Control (UICC) classification. The study was registered with the institutional Clinical Audit Standards and Effectiveness team.

Inclusion criteria: patients discussion at MDT on the basis of CT confirmed UGI mural thickening with no prior endoscopy (radiologist blind to endoscopic findings).

Exclusion criteria: patients discussed at MDT when CT was performed after endoscopy and endoscopic findings known to the reviewing radiologist.

Statistics: Statistical significance taken at $p<0.05$ using chi-squared statistical test.

Results

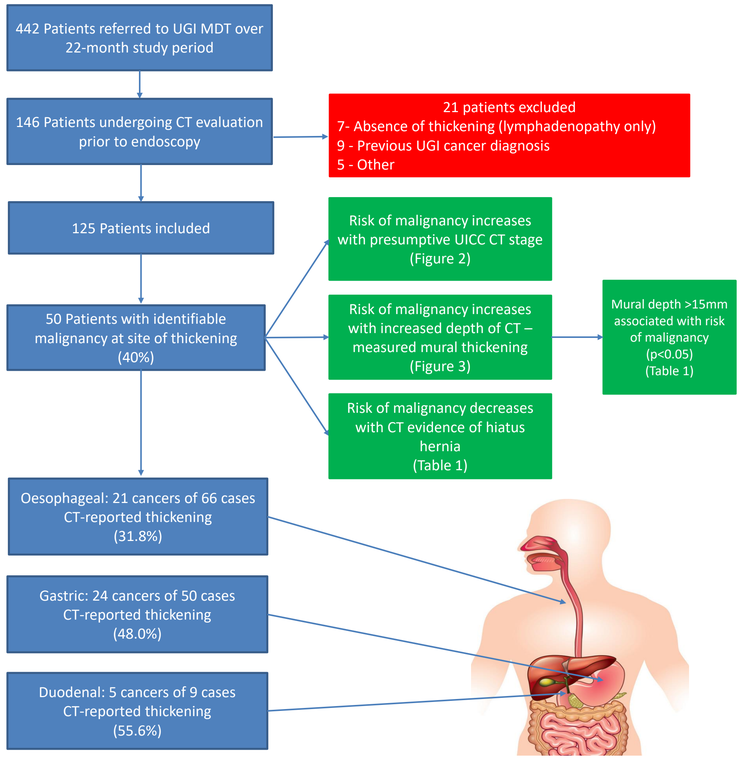

Figure 1. Flow diagram demonstrating patient cohort identification (N=125/456), risk of cancer within cohort (50/125; 40%), results of subgroup analysis, and diagram demonstrating rate of same-site cancer by anatomic site of thickening.

	Cancer (N=50)	No Cancer (N=75)	Total (N=125)	p-value
Male:Female	32:18	37:38	69:56	0.106
Age >75years	19/50	31/75	50/125	0.709
Thickening >15mm	42/50	44/75	86/125	0.003*
Lymphadenopathy	31/50	30/75	61/125	0.015*
Hiatus Hernia**	3/26	20/42	23/68	0.003*

Table 1. Data table demonstrating frequency of malignant or non-malignant finding by population and CT characteristics. *indicates significance at $p<0.05$. **only patients with thickening around the gastro-oesophageal junctional included (N=68).

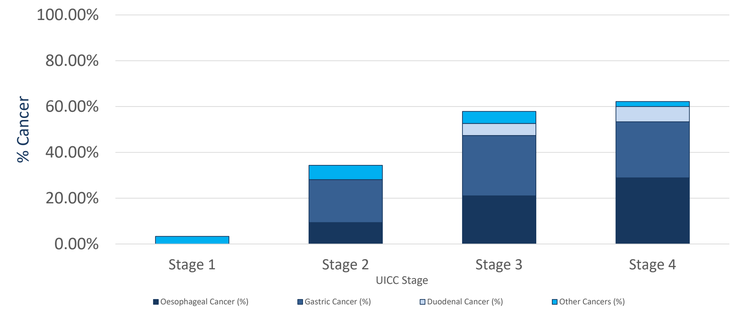

Figure 2. Stacked column graph to demonstrate the relationship between presumptive radiologic (UICC) staging of UGI mural thickening against likelihood of subsequent cancer diagnosis at the same site.

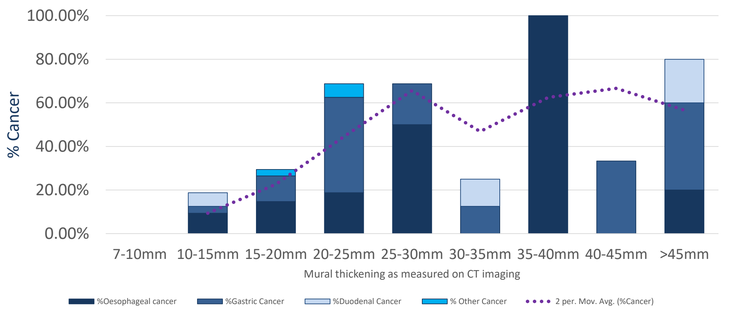

Figure 3. Stacked column graph to demonstrate the relationship between depth of mural thickening measured on CT imaging against likelihood of subsequent cancer diagnosis at the same site, with 2-point moving average line of total cancer diagnoses by degree of mural thickening.

Conclusions

- The risk of a cancer diagnosis among patients with isolated mural thickening >15 mm but no extramural abnormalities was 34.3%, compared to 58.2% for those with lymphadenopathy, potential metastatic disease or both ($p<0.05$).
- 40% of patients referred for upper GI MDT discussion on the basis of mural thickening subsequently received a diagnosis of cancer at the same site.
- The likelihood of receiving a cancer diagnosis increased as the depth of mural thickening increased and also when extramural abnormalities were identified.
- The presence of a hiatal hernia frequently caused confusion in the radiologic interpretation of the gastro-oesophageal junction.
- On the basis of these findings, all patients with mural thickening of the upper GI tract should continue to be offered diagnostic endoscopy.

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Poster 107: Exploration of patient trust on the use of multiparametric magnetic resonance imaging for the diagnosis of prostate cancer: Qualitative interim analysis of the PACT study

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Introduction

- Biomedical advances, including multiparametric magnetic resonance imaging (mpMRI) have improved diagnostic accuracy for suspected prostate cancer, however, little is known about men's views regarding this development
- In prostate cancer, uncertainty still exists about diagnostic and treatment choices, meaning that mpMRI may impact on decision making and trust exhibited in clinicians

Objective

- Use a qualitative approach to explore men's views on diagnostic modalities for suspected prostate cancer, in particular, mpMRI

Methods & Materials

- Within the larger PACT study, men with suspected prostate cancer were invited to give their views on the diagnostic use of mpMRI, using a two-phase, mixed-methods approach (Figure 1)
- Questionnaires and semi-structured interviews gathered the views of men referred with suspected prostate cancer, with mixed previous experiences of the diagnostic process (Figure 2)
- Transcribed interviews were subjected to thematic qualitative analysis to reveal consensus concerning the impact of mpMRI technology on their expectations and concerns

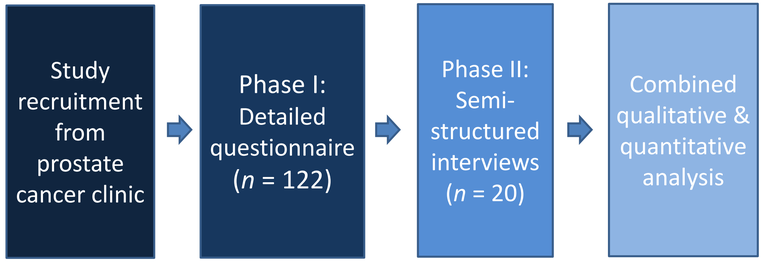

Figure 1. Mixed-methodology study phases of the PACT study

Results

- For this interim analysis, six men's interviews are considered
- All exhibited strong trust in the expertise of clinicians, taking possible benefits and drawbacks of non-mpMRI modalities at face value, and citing preference for face-to-face urological consultations as the most favoured option for receiving a cancer diagnosis
- All participants demonstrated strong trust in the diagnostic benefits afforded by prostate mpMRI, favouring especially its non-invasive approach, and quoting only slight or no concern that mpMRI could overlook evidence of cancer (Figure 3)
- Given the trust placed in clinicians employing mpMRI, it is important to consider the risk of men adopting a reduced sense of uncertainty and unquestioning trust in technology or clinicians

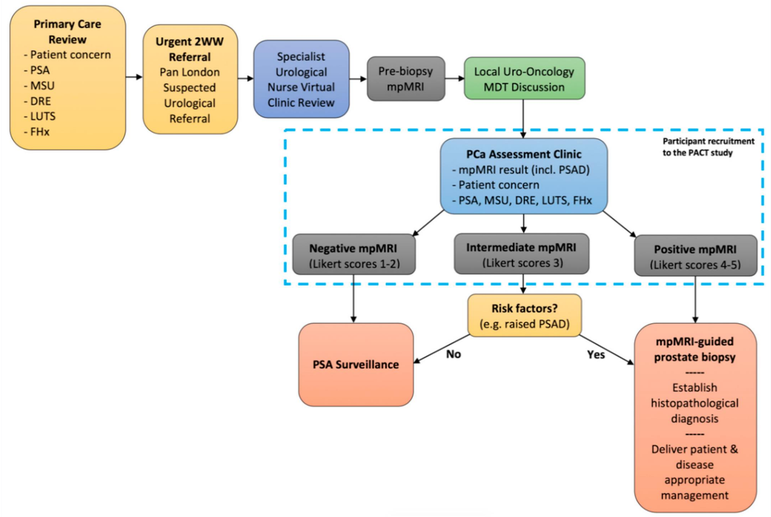

Figure 2. Clinical pathway for suspected prostate cancer. Men at risk of prostate cancer (e.g. with raised PSA) are are referred from primary care urgently for secondary care assessment. After specialist nurse review, men undergo pre-biopsy mpMRI and are then reviewed in clinic – at this point they are invited to take part in the two-phase PACT study.

Trust in clinicians

On receiving diagnostic information:

"Getting information directly from people who are doing the procedure… is always going to be better than random searches of the internet"

"Most useful information, of course, is going to be from somebody like you, who's doing the treatment"

"If there are issues… I'm going to seek professional advice rather than try and work it out myself – you wouldn't learn how to build a house of the internet!"

Regarding indolent prostate cancers:

"I wouldn't want to know about them, because I value your professionalism and knowledge"

Trust in technology

Comparing mpMRI to transrectal biopsy:

"One hundred times better, I'm glad I got the new way!"

Anything concerning regarding mpMRI:

"I wouldn't say that there's anything at all"

Regarding sensitivity of mpMRI:

"Well, nothings ever fool-proof... but we are trying to get as good as we can"

On new types of MRI (biparametric MRI):

"If the medical profession could reassure themselves and, in turn, their patients, that nothing or very little is lost by changing [mpMRI] to another system – everyone would be comfortable with that"

Trust in information sources

On medical information sources:

"You could go onto the obvious things – NHS sites, NICE sites – but they tend to pretty simplistic. So, I do sit and wade my way through medical papers, sometimes"

"I think its good having a sort of face-to-face [with a consultant] rather than getting something through the post"

Regarding searching for prostate cancer / prostate MRI information online:

"No, because you scare yourself to death!"

Figure 3. Selected quotes from men with suspected prostate cancer, with a focus on trust exhibited in clinicians and technology

Conclusions

- Men appear accepting and trusting of the diagnostic favourability of an mpMRI-directed diagnostic pathway
- However, the trust intrinsic to the patient-clinician relationship should be open to scrutiny when innovative diagnostic technologies are promoted, to allow uncertainty to be acknowledged and prevent unquestioning or biased interactions in the clinic

Funding Acknowledgements
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Disclosure statement
No conflicts of interest to declare

Study Protocol

MRC Medical Research Council

UCL

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NHS Whittington Health NHS Trust

Poster 108: Pulmonary Metastasectomy: Does It Make a Difference?

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Background

Pulmonary metastasectomy for colorectal cancer has caused much debate amongst thoracic surgeons over the years and the question regarding its impact upon overall prognosis remains unanswered. Proponents of pulmonary metastasectomy will cite data, quoting a 50% (+/-5%) survival rate at 5 years[1], but an argument can be made that resection of these metastases does not impact upon prognosis. A randomised control trial was developed to finally answer this question, however failed to recruit significant numbers for a meaningful statistical analysis[2]. Favourable prognostic factors, such as a single metastasis, a long disease-free interval and a low carcinoembryonic antigen are indicative of improved prognosis, but do not specifically address the additional benefit of pulmonary metastasectomy.

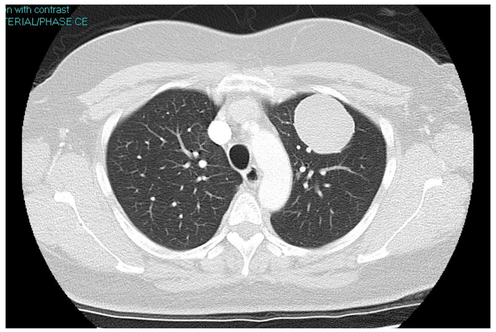

Figure 1. Patient with large left upper tri-segment metastasis

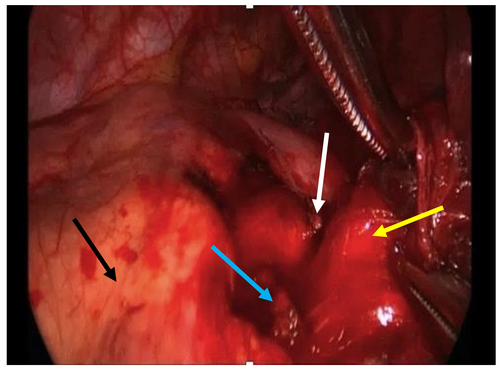

Figure 2. VATS approach left upper lobe tri-segmentectomy. Bronchus (yellow arrow), pulmonary vein stump (blue arrow), first branch of pulmonary artery stump (white arrow), phrenic nerve (black arrow).

Methods and Materials

- We examined the outcomes of patients at our centre following pulmonary metastasectomy.
- Data was collected from a prospectively filled database.
- All patients that underwent resection for lung metastasis secondary to colorectal cancer were included.
- From July 2013 to July 2016, 120 patients were identified who underwent pulmonary metastasectomy for colorectal cancer.
- Demographic and outcome data were analysed and a Kaplan Meier survival curve plotted.

Results

- The mean age of the cohort was 66, 64% were male, median ASA was 2, PS 0 and MRC dyspnoea score 0.
- All procedures were performed electively. Resection consisted of 87 wedge resections, 32 lobectomies and 1 pneumonectomy.
- Of these, 6% experienced postoperative complications, including lower respiratory tract infection, prolonged air-leak, postoperative arrhythmia and reoperation.
- Kaplan-Meier survival analysis showed a survival of 99% at 90 days, 92% at 1 year, 66% at 3 years and 45% at 5 years.

Discussion

- Pulmonary metastasectomy for colorectal cancer can be performed safely and with a low mortality rate.
- Overall survival at 5 years following resection was 45%, comparable to the PulMiCC trial[2] and other large observational studies[3].
- A randomised trial has reported a better survival in the control group than previously assumed[4] and the benefit of pulmonary metastasectomy needs to be questioned.

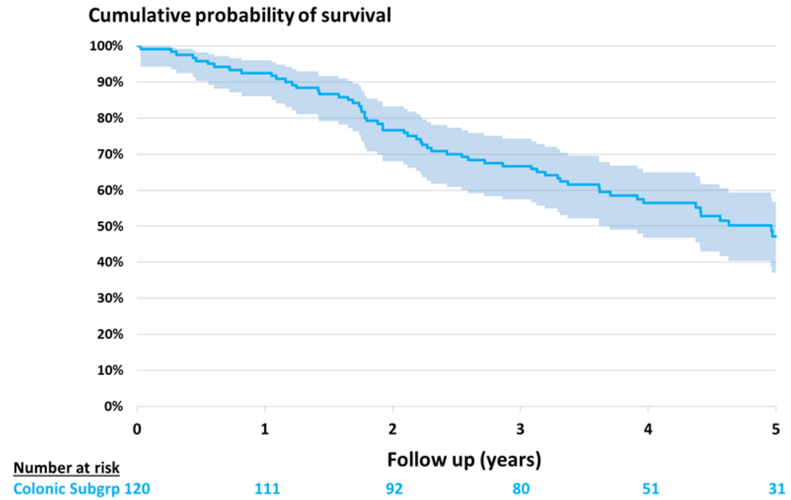

Chart 1. Kaplan Meier survival curve following pulmonary metastasectomy for colorectal cancer.

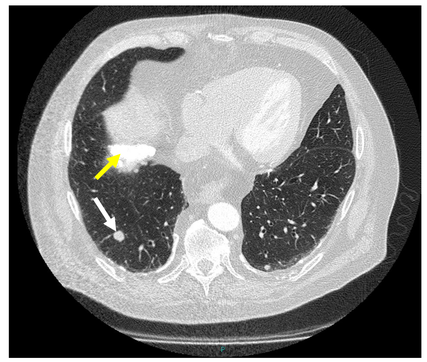

Figure 3. CT scan of a 73 year old gentleman who had an anterior resection 3 years ago for a T3N1 rectal cancer. Follow-up CT scan at 2 years shows a new lesion in the right lower and left lower lobes, suspicious for metastasis (white arrow) also has pleural plaques (yellow arrow).

Conclusions

Pulmonary resection for metastatic colorectal cancer can be performed with minimal morbidity and good a survival nearing 50% at 5 years, the debate as to whether resection ultimately impacts prognosis rages on!

Contact

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Poster 110: National survey of surgeon practice in the assessment and optimisation of older adults facing major gastrointestinal surgery

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Introduction / Background

Major gastrointestinal surgery rates in older patients (65 years+) vary across the UK(1). There is a lack of evidence-based guidelines on how older patients should be assessed and optimized before and after major surgery. As a result, practice varies(2). There are a number of targeted interventions, such as prehabilitation, geriatric multidisciplinary input and rehabilitation programmes, that may improve outcomes in the older patient population if patients are appropriately identified(3,4,5).

Objectives

This study aims to determine current UK surgical practice in the assessment and optimisation of older patients undergoing major surgery across all surgical gastrointestinal subspecialties and geographical regions.

Methods and Materials

A Google Forms survey was developed covering the assessment and optimisation of the older patient and factors affecting decision-making in the elective and emergency settings. The design of this was informed by semi-structured interviews that were carried out with a wide range of healthcare professionals and the published literature. A Discrete Choice Experiment (DCE) was designed to establish surgeon management preference in hypothetical scenarios based on age, functional status, co-morbidity level, cognitive impairment, pathology and mode of presentation (elective or emergency).
The survey was piloted prior to dissemination. Consultant surgeons and post-CCT fellows were recruited via Twitter, surgical society e-mail distribution lists and by e-mail to study team contacts. Responses from surgeons practicing outside the UK were excluded. The response rate was calculated using a Bitlink to determine the proportion of people completing the questionnaire after clicking on the link.
Ethical approval was granted 19/HRA/5964. Data collection was carried out between August and November 2020. All analyses were performed in Microsoft Excel.

Results

Demographics
103/256 (40.2%) surgeons completed the survey across all major subspecialties (colorectal 55%, oesophagogastric 32%, hepatobiliary 13%) (Figure 1). 75% (77/103) of respondents were male. The mean duration of consultant practice was 9.9 years (range 0 – 39 years). Responses were gathered from across the UK, with the largest proportion working in the Yorkshire and Humber Deanery 32/103 (31%) (Figure 2).

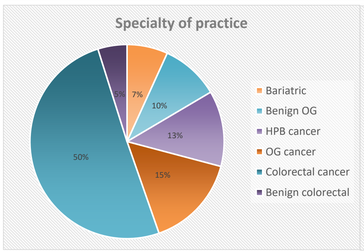

Figure 1. Pie chart depicting Specialty of practice

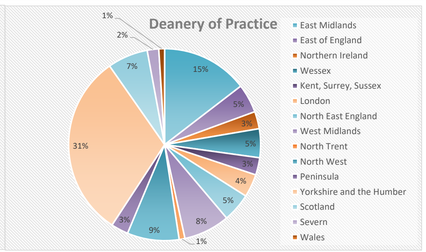

Figure 2. Pie chart depicting Deanery of practice

Results

Elective Assessment
Routine elective assessment varied considerably, particularly regarding assessment of frailty, objective assessment of fitness and cognitive assessment (Figure 3)

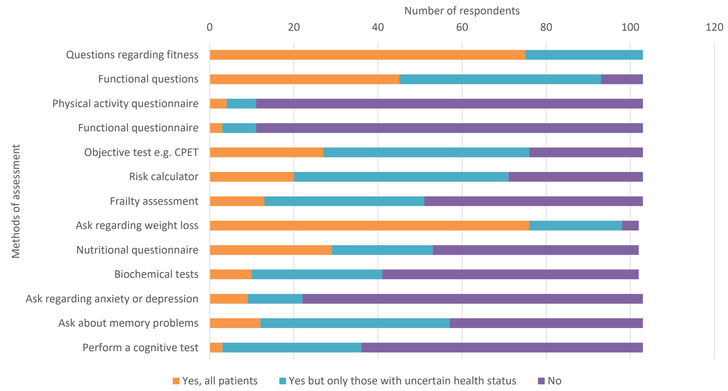

Figure 3. Bar chart demonstrating range of practice in elective assessment of older patients.

Emergency Assessment
Assessment in the emergency setting also varied considerably

- 51/103 (49.5%) of surgeons ask about functional ability only in patients in whom they had concerns
- Only 67/103 (65.0%) routinely perform a risk calculation for all emergency patients
- 45/103 (43.7%) do not perform a frailty assessment in emergency patients.

Optimisation
Again, practice varied considerably, particularly in relation to referral for formal prehabilitation programmes, nutritional and geriatric support. (Table 1).

		Elective			Emergency		
Optimisation strategies		Yes, all	Yes, selected	No	Yes, all	Yes, selected	No
Pre-operative	Follow ERAS protocol	92	5	6			
	Transfuse or iron infusion if anaemic	89	11	3	58	31	14
	Medication review	21	13	68	30	14	59
	Geriatrician review	4	38	61	14	40	49
	Occupational therapy review	2	19	81	9	28	66
	Social service input	1	31	70	4	32	67
Intra-operative	Attempt a laparoscopic procedure if feasible	97	2	4	86	7	10
	Follow ERAS protocol	97	2	4	88	2	13
	Use regional analgesia e.g. epidural, wound catheters	93	4	6	95	4	4
Post-operative	Physiotherapy input	83	19	1	80	22	1
	Follow ERAS protocol	95	3	4	82	7	14
	CNS input	85	14	4	68	20	15
	Dietician input	57	37	9	51	48	4
	Geriatrician input	19	57	27	30	56	17
	Occupational therapy review	32	62	9	33	58	12
	Social service input	29	66	8	29	68	6
	Formal rehabilitation programme	10	40	53	7	40	56

Table 1. Detailing the responses to peri-operative optimization strategies for elective and emergency patients.

Results

Decision-making
When asked about factors that affect their decision-making, surgeons rated moderate-severe heart, liver or renal failure, pre-existing dementia and functional impairments highly. Availability of other treatment options to alleviate symptoms was also important (Figure 4).

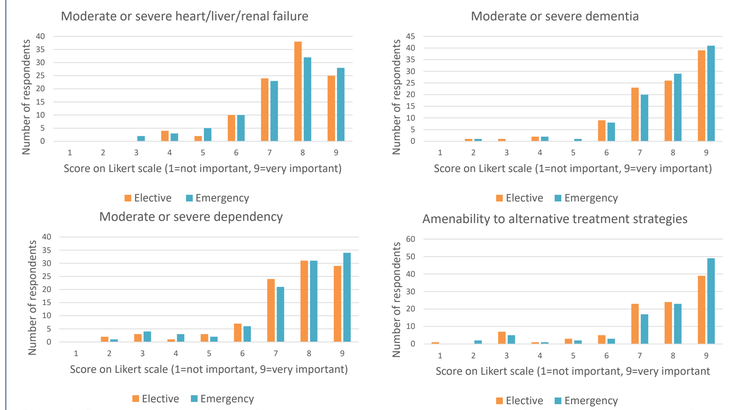

Figure 4. Graphs demonstrating the importance of moderate to severe heart/liver/renal failure, dementia, dependency and availability of alternative treatment strategies on decision making.

Discrete Choice Experiment
The Discrete Choice Experiment revealed clear management agreement (more than 85% respondents giving the same opinion) for 12 out of the 16 scenarios. The six scenarios where there was treatment uncertainty were more likely to be for elective management of patients with non-malignant disease in patients with moderate to severe functional or cognitive impairment.

Discussion

This study suggests that detailed assessments of fitness, nutritional and psychological status are not uniformly carried out in all patients and that opportunities to identify modifiable factors may be missed. Surgeons report different levels of utilization of optimisation strategies; the reasons for this are multifactorial and include variable availability of relevant professionals (e.g. geriatricians, dieticians, perioperative anaesthetists) and lack of funding. This study has revealed treatment uncertainty particularly in the management of patients with moderate to severe cognitive or functional impairments. This suggests that more should be done to adequately assess patients to facilitate shared decision-making where there is uncertainty regarding the best management approach.
This study is limited by the self-selected nature of respondents; that they are more likely to be interested in the topic to have completed the questionnaire. Despite this, considerable variation has been demonstrated.

Conclusions

The assessment and optimization of older patients for major GI surgery varies considerably. This suggests that guidelines for National practice are needed and resources need to be standardised. Further work is needed to explore the reasons for practice variation and its effects on outcomes.

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BOWEL RESEARCH UK.

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Poster 112: Robotic surgery increases rates of minimally invasive mediastinal mass resection

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Background

- Robotic surgery may be well suited to the resection of mediastinal masses with 3D visualisation and wristed surgical instruments.
- Minimally invasive techniques have been shown to be comparable to open surgery in terms of complete resection and early oncological outcomes for thymic epithelial tumours (1,2).
- Robotic mediastinal mass excision is feasible and safe (3-6) may reduce postoperative complications compared to open surgery with no increase in incomplete resections (7).

Objectives and Methods

- We aimed to compare outcomes of mediastinal mass resection in our pre-robotic and robotic eras and between the VATS and robotic techniques.
- Retrospective case note analysis was undertaken from November 2015 to September 2019.
- All biopsies, mediastinoscopies, thyroidectomies and thymectomies for non-thymomatous myasthenia gravis were excluded.
- 51 operations in the pre-robotic era and 42 in the robotic era.

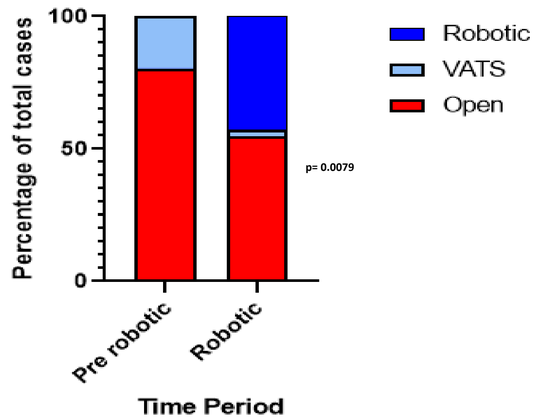

Figure 1 Bar chart showing different operative approaches in the pre-robotic and robotic periods .

Results

MINIMALLY INVASIVE SURGERY

- Rates of minimally invasive mediastinal masses resections increased from 20% in the pre-robotic era to 45% in the robotic era (p=0.0079).

LENGTH OF STAY

- Length of stay was shorter following the introduction of robotic surgery (median of 3 days (IQR 2-5) versus 4 days (IQR 3-5) (p=0.068)).
- Both VATS (p<0.0001) and robotic surgery (p<0.0001) had significantly shorter length of hospital stay than open surgery.

CRITICAL CARE USE

- Fewer minimally invasive cases went to critical care post-operatively compared to open (88.64% v 27.59%, p<0.0001).

PAIN

- There was a trend towards less post-operative strong opioid use in the robotic group (median 24mg [IQR 4-33mg]) versus the VATS group (median 32mg [IQR 18-40mg]) (p=0.073).

Discussion

- The introduction of robotic mediastinal surgery has resulted in more patients receiving a minimally invasive mediastinal resection.
- Those undergoing minimally invasive surgery were more likely to be managed on the ward post-operatively.
- Patients undergoing resection for benign thymic hyperplasia may represent a more homogenous group in which a randomised control trial comparing VATS and open surgery to robotic may be possible.

Conclusions

The introduction of robotic surgery at our institution has led to more patients receiving a minimally invasive mediastinal resection. Minimally invasive resection results in a shorter median length of stay and less routine critical care use compared to open.

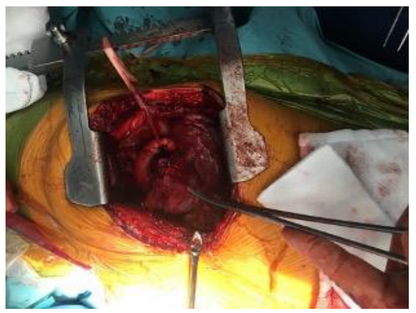

Figure 2. Median sternotomy for total thymectomy for a thymoma

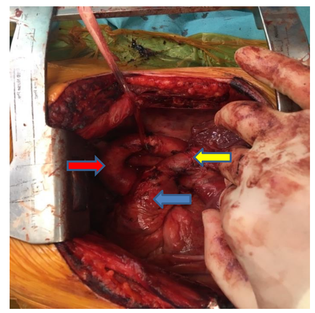

Figure 3. Mediastinum post thymectomy. The arch of aorta is clearly seen (red arrow) and left main pulmonary artery (yellow arrow) arising from the pulmonary trunk (blue arrow)

Contact

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Poster 119: Histopathological basis of prostate cancer conspicuity on multiparametric magnetic resonance imaging: A systematic review and meta-analysis

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Introduction

- Multiparametric magnetic resonance imaging (mpMRI) affords accurate pre-biopsy detection of clinically significant disease
- Cancer detection by mpMRI is strongly associated with high histopathological grade & tumour volume, however, it is likely that other clinically meaningful histopathological features (Figure 1) also influence disease conspicuity on mpMRI

Objectives

- Collate & synthesise the extant literature describing the histopathological basis of prostate cancer conspicuity on mpMRI, for the first time

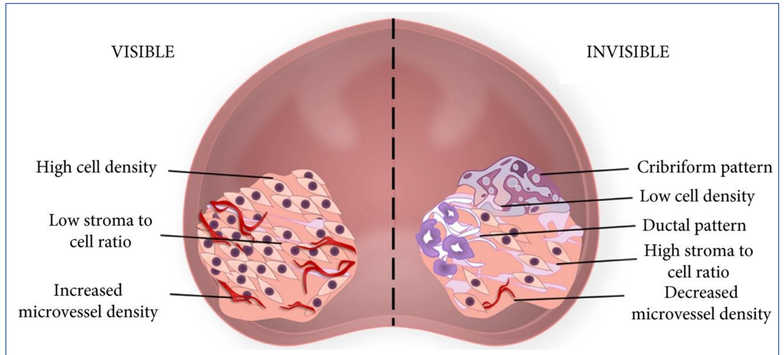

Figure 1. Key histopathological differences between mpMRI-visible (*left*) and mpMRI-invisible prostate cancer (*right*)

Methods & Materials

- Systematic literature search performed using Medline, Embase, PubMed & Cochrane databases up to August 2020, in accordance with the PRISMA statement
- Primary endpoint was quantitative differences in histopathological features between mpMRI-visible and mpMRI-invisible tumours
- Secondary endpoints were explanatory links between histopathological features and mpMRI conspicuity, and potential clinical implications
- Meta-analysis was performed to compare proportions of cribriform architecture (Figure 2) between mpMRI-visible and mpMRI-invisible cancer, to challenge the common perception of cribriform as mpMRI-invisible
- Overall proportions of cribriform were compared and significant outliers were assessed using leave-one-out estimates & diagnostic plots
- Following outlier removal, a random-effects model was refit & estimates stratified by mpMRI visibility status
- The review was prospectively registered with PROSPERO (CRD42020176049)

Results (1)

- 323 articles were retrieved
- 17 met criteria for inclusion

Results (2)

Thematic synthesis

- Tumour grade & size were key determinants of cancer conspicuity on mpMRI
- mpMRI-visible cancers demonstrated increased cellular & microvessel density, glandular-to-stromal ratio, peripheral zone location, homogenous morphology & capsular proximity
- Furthermore, conspicuous cancer contained higher prevalence of intraductal carcinoma or cribriform disease, and a propensity for glomeruloid, poorly-formed & fused glands, compared to mpMRI-invisible disease

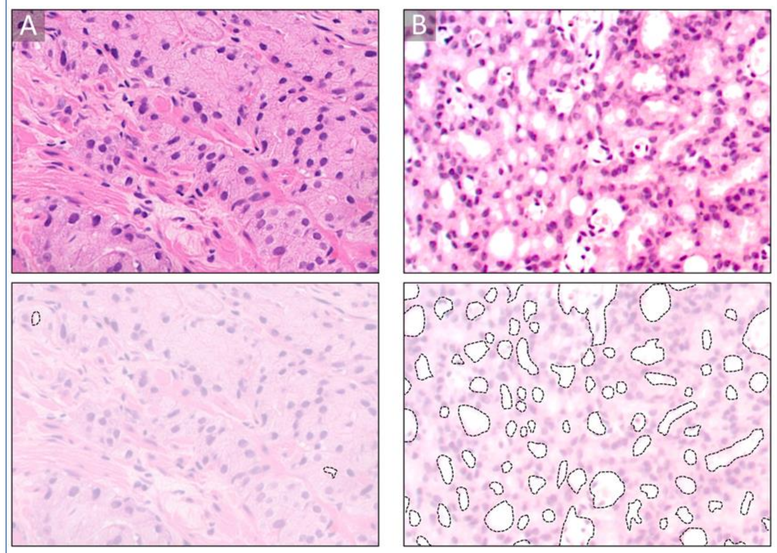

Figure 2. Cribriform pattern prostate cancer (*B*) is typified by numerous punched-out lumina (*bottom panel, highlighted with dotted lines*). These numerous lumina could theoretically result in reduced restriction of water diffusion compared with typical Gleason 4 pattern prostate cancer (*A*), which may in turn result in reduced signal on the diffusion-dependent MRI sequences, including the diffusion-weighted imaging (DWI) sequence and the apparent diffusion coefficient (ADC) map

Results (3)

Meta-analysis

- Four studies compared proportions of cribriform architecture & were suitable for meta-analysis
- The final model included three studies and despite mixed methodologies, had low heterogeneity (I^2) of just 27% (p = 0.26)
- There were no significant differences between proportions of tumours harbouring cribriform (Figure 3)
- mpMRI-visible: 30% [95% CI: 23-39%]
- mpMRI-invisible: 29% [95% CI 18-42%]
- p = 0.85

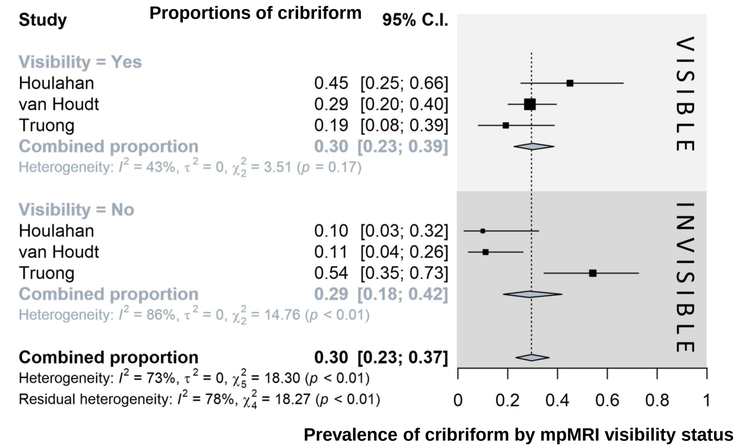

Figure 3. Forest plot for meta-analysis of studies assessing proportion of cribriform cancer stratified by mpMRI visibility

Conclusions

- mpMRI-visible cancer exhibits pathological features that contribute to MRI conspicuity, especially, increased tumoural density
- These characteristics may also confer less favourable prognosis for mpMRI-visible cancer compared to mpMRI-invisible disease
- Through meta-analysis, we have demonstrated no significant differences in cribriform pattern proportions based on mpMRI visibility, thus challenging a common notion regarding pathological correlates of conspicuity

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Disclosure statement
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PROSPERO

Review Protocol

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UCL

Poster 122: A Prospective Cohort Study to Establish if the Method of Anastomosis (Intracorporeal or Extracorporeal) in Right Colectomy for Cancer Has an Impact on the Postoperative Outcome

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Introduction / Background

Laparoscopic right colectomy is the gold standard for surgical resection of right sided colon cancer. Joining the remaining bowel can take place in two ways, **Intracorporeal Anastomosis (ICA) –** within the abdomen *fig. 1* - and **Extracorporeal Anastomosis (ECA)** – outside the abdomen via the extraction site *fig. 2*.

Although more technically challenging than ECA, ICA is becoming more achievable with improvements in laparoscopic training and robotic surgery (for which ICA is invariably used) and has been found to show potential benefits in reducing postoperative complications[(1,2)]. This field, despite few published studies, has great implications in promoting the best practice to ensure better patient outcomes.

Objectives

This is a comparative cohort study that focuses on minimal access surgery (i.e. laparoscopic or robotic surgery) for right colonic cancer. Two different techniques of bowel anastomosis are compared.

Primary objectives:
Length of stay in hospital (LOS)
Overall morbidity
Secondary objectives:
Frequency of Surgical Site Infection (SSI), number of lymph nodes retrieved (LN) and **adherence to enhanced recovery program (ERP).**

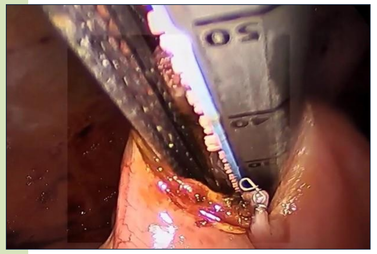

Figure 1. Stapling via ICA approach.

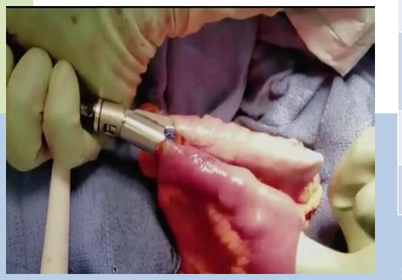

Figure 2. Stapling via ECA approach.

Methods and Materials

This cohort study followed patients for 90 days postoperatively after undergoing laparoscopic or robotic right colectomy for bowel cancer over 2 years (6/2017-6/2019), with groups divided by type of anastomosis (ICA vs ECA). 30 patients underwent robotic surgery.

Data collected includes demographics, tumour stage; intraoperative findings and complications; postoperative outcomes including morbidity and mortality, postoperative ileus and gastroparesis. Data was analysed statistically using IBM SPSS 24.0 software and paired t-test.

Results

The study cohort is comprised of 33 patients who underwent ICA, and 96 who underwent ECA. Baseline characteristics were similar in both groups (*table 1).*

Primary objectives
LOS: ICA (5.75 (SD 2.6) days) was lower than ECA (8.97 (SD 4.3) days) (p=0.033) *(Table 2),* with a difference in mean stay of more than 3 days
Morbidity: ICA (0.5 (SD 0.52) events) had fewer post op complications than ECA (1.17 (SD 2.08) events) (p=0.04), with a prevalence in the ECA group more than double that of ICA.
Secondary objectives
No significant difference was found between ICA and ECA *(Table 2).*

Table 1. *Baseline characteristics for both cohorts*

	ICA	ECA	difference
n	33	96	1:3
Age – Mean (SD)	73 (12)	74 (13)	1 p=0.73
Gender - % male	33%	38%	5% p=0.26
BMI - Mean (SD)	28 (5)	26.9 (4.6)	1.1% p=o.74
ASA I+II	66%	80%	14% p=0.59

Table 2. *Postoperative outcomes for patients undergoing ICA vs patients undergoing ECA*

	ICA	ECA	difference	
LOS Mean(SD)	5.75 (2.6)	8.97 (4.3)	3.2 p=0.033	**Statistically significant mean LOS of over 3 days longer in ECA group than ICA.**
Morbidity Mean(SD)	0.5 (0.52)	1.17 (2.08)	0.67 p=0.04	Statistically significant increased morbidity, with **mean prevalence of postoperative complications more than double in the ECA group than the ICA group**
LN Mean (SD)	24 (8.2)	21 (5.3)	3 p=0.4	Despite reduced SSI in the ICA group, and greater completion of ERP, no statistically significant difference was found between ICA and ECA for all secondary objectives
ERP	91%	80%	11% p=0.38	
SSI	2 (0.5)	9 (1.4)	7 p=0.22	

Discussion

This cohort study has demonstrated significantly reduced hospital stay for patients undergoing ICA, as well as a statistically significant reduced postoperative morbidity. This correlates with currently available literature on this subject[(1)], but having clear evidence drawn from practice will be vital in promoting one technique over the other. From a physiological perspective, ICA implies less trauma exerted on tissues than ECA, which reduces risk of perioperative complications which in turn reduces length of hospital stay.
Although these are significant results, the study was limited by having a small number of patients in cohort (129) in a single centre study, with only 7 surgeons involved. This study looked at total complications and only specifically at SSI, compared with others which looked at anastomotic leakage and conversions to open amongst other more specific outcomes[(1)] which future studies may choose to focus on more closely.

Conclusions

This study suggests that ICA leads to better recovery for patients. Despite being a more technically challenging approach, it has advantages in improving patient outcomes, and reducing afferent costs with reduced stays in hospital.
As research progresses on this topic, a randomised controlled trial may give us further evidence of the benefits of ICA over ECA and could certainly lead to increased efforts in streamlining surgical training in this method.

References
1. **Intracorporeal versus extracorporeal anastomosis in minimally invasive right colectomy: an updated systematic review and meta-analysis; Emile et al. (2019) PMID 31646396**
2. **Intracorporeal versus extracorporeal anastomosis after laparoscopic right hemicolectomy for cancer: a systematic review and meta-analysis; Feroci et al. International Journal of Colorectal Disease. 28(9):1177–86**

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