Abstracts for Presentation at the BASO ~ The Association for Cancer Surgery Annual Scientific Meeting 17th- 18th November 2019
Ronald Raven Prize Papers
Sunday 17th November 2019, 09.00 to 10.00

2.

PREDICTING RESPONSE TO NEOADJUVANT THERAPY IN OESOPHAGEAL ADENOCARCINOMA PRE-TREATMENT BIOPSIES

Megan Lloyd, Fereshteh Izadi, Rob Walker, Annette Hayden, Jack Harrington, Ben Grace, Jo Horne, Maria Machado, Irina Fesenko, Saqib Rahman, Tim Underwood. *University of Southampton, Southampton, UK*

Background: We urgently require tools to predict response to neoadjuvant therapy (NAT) in oesophageal adenocarcinoma. This pilot study aims to identify differentially expressed genes in pre-treatment biopsies between responders and non-responders to NAT.
Method: Diagnostic formalin fixed paraffin embedded tissue from 26 responders (Mandard Tumour Regression Grade (TRG) 1-2) and 30 non-responders (TRG 4-5) underwent gene expression profiling with two nuclease protection assays (EdgeSeq, HTG — Oncology Biomarker Panel and Precision Immuno-Oncology Panel). Analysis of clinical characteristics and gene expression was performed in "R".
Results: There were no differences in pre-treatment characteristics between responders and non-responders. Responders had better mean overall survival than non-responders (3.76 years and 2.95 years, respectively. $p=0.047$).
Genes significantly up-regulated in responders were involved in apoptosis and cell cycling whilst those upregulated in non-responders were involved in cytokine signalling and the immune response. Using a threshold of log2 fold change >1 and $p <0.05$, we identified 26 and 11 differentially expressed genes between responders and non-responders from the Oncology Biomarker Panel and Immuno-Oncology Pane, respectively. Using the 26 differentially expressed genes from the biomarker panel, we created a model to predict response to NAT, which had an overall accuracy of 73% with sensitivity of 80% and specificity of 70%.
Conclusion: Accurate prediction of response to NAT would allow non-responders to be diverted straight to surgery or to receive an alternative treatment. Further study using widely available stored tissue may allow us to improve the performance of our model to predict response to NAT in the clinic.

21.

SYMPTOMATIC BREAST CANCERS AND WHY BREAST PAIN MAY NOT ALWAYS NEED CLINICAL REVIEW

Jeremy Batt, Nicola Cook, Clare Fowler. *Cheltenham General Hospital, Cheltenham, UK*

Background: Breast pain contributes a heavy burden to the symptomatic breast clinic, accounting for a large number of referrals due to patient/clinician subjective anxiety and unclear aetiology. We assess the link between breast pain and cancer with a view to easing the demand on breast services.
Methods: All new breast cancer diagnoses were identified from the MDT outcomes for the 12 months between October 2017 and 2018. Presenting symptoms were identified from the GP and consultant letters. Examination findings were checked with details on imaging requests.
Results: 434 new symptomatic cancer diagnoses were made in patients with an average age of 68. 332 patients were referred by GP's as two-week waits. New lumps accounted for 294 ipsilateral cancer diagnoses, nipple symptoms for 28 and pain with normal examination for 4 (screening aged patients). Incidental cancers in the contralateral, non-symptomatic breast were identified via mammography alone in 5 cases. 3 further cases were detected when previously unfound lumps were identified in clinic by the consultant and were subsequently confirmed via mammography.
Conclusions: Pain does not appear a reliable symptom in breast cancer presentation. It was more common for patients to have incidental, contralateral asymptomatic cancer than it was for patients with pain alone to have underlying ipsilateral cancer. All cancers were identified accurately on mammography. There is little benefit in repeated clinical examination by a Breast Specialist in patients presenting with pain as an isolated symptom. Direct to test with mammography could be safe, effective and efficient alternative practice.

25.

MACHINE LEARNING TO PREDICT EARLY RECURRENCE AFTER OESOPHAGEAL CANCER SURGERY

Saqib Rahman[1], Robert Walker[1], Megan Lloyd[1], Ben Grace[1], Gijs van Boxel[2], B Feike Kingma[2], Jelle Ruurda[2], Richard van Hillegersberg[2], Scott Harris[3], Simon Parsons[4], Stuart Mercer[5], Ewen Griffiths[6], J.Robert O'Neill[7], Richard Turkington[8], Rebecca Fitzgerald[9], Timothy Underwood[1]. [1] *Cancer Sciences Unit, University of Southampton, Southampton, UK;* [2] *University Medical Centre, Utrecht, Netherlands;* [3] *Public Health Sciences & Medical Statistics Department, University of Southampton, Southampton, UK;* [4] *Department of Surgery, Nottingham University Hospitals NHS Trust, Nottingham, UK;* [5] *Department of Surgery, Portsmouth Hospitals NHS Trust, Portsmouth, UK;* [6] *Department of Upper Gastrointestinal Surgery, University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK;* [7] *Cambridge Oesophagogastric Centre, Addenbrookes Hospital, Cambridge University Hospitals Foundation Trust, Cambridge, UK;* [8] *Centre for Cancer Research and Cell Biology, Queen's University Belfast, Belfast, UK;* [9] *Hutchison/Medical Research Council Cancer Unit, University of Cambridge, Cambridge, UK*

Background: Early cancer recurrence after oesophagectomy is a common problem with an incidence of 20-30% despite the widespread use of neo-adjuvant treatment. Quantification of this risk is difficult and existing models perform poorly. Machine learning techniques potentially allow more accurate prognostication in areas of complex variable interaction. This study aimed to develop a predictive model for early recurrence using machine learning techniques and routinely available clinico-pathologic characteristics in a large, international, multi-centre cohort.
Methods: Consecutive patients who underwent oesophagectomy for adenocarcinoma and had neoadjuvant treatment in 6 UK and 1 Dutch oesophago-gastric units were analysed. Using clinical characteristics and post-operative histopathology, models were generated using elastic net regression (ELR) and the machine learning methods random forest (RF) and XG boost (XGB). Finally, a combined (Ensemble) model of these was generated. The relative importance of factors to outcome was calculated as a percentage contribution to the model.
Results: In total 812 patients were included. The recurrence rate at less than 1 year was 29.1%. All of the models demonstrated good discrimination. Internally validated AUCs were similar, with the Ensemble model performing best (ELR=0.785, RF=0.789, XGB=0.794, Ensemble=0.806). Performance was similar when using internal-external validation (validation across sites, Ensemble AUC=0.804). In the final model the most important variables were number of positive lymph nodes (25.7%) and vascular invasion (16.9%).
Conclusions: The derived model using machine learning approaches and an international dataset provided excellent performance in quantifying the risk of early recurrence after surgery and will be useful in prognostication for clinicians and patients.

30.

BREAST SCREENING AGE EXTENSION; HIGH CANCER PICK UP RATE OF SMALL BREAST CANCERS AMENABLE TO BREAST AND AXILLARY CONSERVATION

Lucy Cielecki, Sian Burley, Blossom Lake, Sue Williams, Donna Appleton. *Shrewsbury & Telford Hospital NHS Trust, Telford, UK*

Background: In 2012, Public Health England (PHE) extended the age range for breast screening up to 73. For screening to be an effective tool, one of

the Wilson criteria is to detect disease that could be treated at an early stage. This audit aimed to measure the effectiveness of the upper age screening extension in Shropshire by comparing the cancer diagnosis rate to general screening population, size of cancer, and the ability to perform breast conservation.

Methods: Retrospective analysis of Breast Screening age extension of women invited to be screened aged 71 to 73 years old in Shropshire. Data included number of women invited, uptake rate, recall rate, cancer diagnosis and surgical treatment.

Results: 5517 older women were invited into Shropshire Breast Screening Programme as part of the AgeX trial by PHE since September 2014. 4801 women attended and were screened; 87% uptake rate, which exceeds BSP attendance rate of >80%. 104 women were recalled to assessment (2.1%) which is below BSP standard of <5% recall rate for incident screens. 46.1% (48) of women recalled to assessment were given a cancer diagnosis, this is compared to 30.5% in general screening population. 41.6% of the invasive cancer was <15mm. 95.8% of patients had surgery, with 70.8% of patients having breast and axillary conservation surgery.

Conclusion: BSP Standards uptake rate and recall rate have been exceeded by upper age extension. Our experience shows high cancer pick up rate of small cancers with the majority patients able to have breast conserving surgery.

61.
A COMPARATIVE STUDY OF MPNST ARISING SPORADICALLY AND IN PATIENTS WITH NF-1

Emma Davies, Emma Dunne, Dirk Strauss, Myles Smith, Charlotte Benson, Shane Zaide, Aisha Miah, Andrew Hayes. *The Royal Marsden Hospital, London, UK*

Background: Malignant peripheral nerve sheath tumours (MPNST) are a rare soft tissue sarcoma originating from the peripheral nerves. They can either arise sporadically or be associated with a germline mutation in the NF-1 gene. We wanted to analyse if there was a difference in outcome between these two groups of patients with this disease treatment.

Method: All patients treated at the Royal Marsden Hospital between 2010 – 2015 with MPNST were identified and analysed in this retrospective review. Kaplan Meier survival curves were constructed on patients with NF or sporadic MPNST.

39 patients were included in the analysis with a 2:1 male female ratio. The median age at diagnosis was 42 years and 46% of patients were NF positive. The site of tumour growth was equally distributed between trunk and limbs; 19 tumours were located in the trunk, 14 in the leg, 5 in the arm and 1 in the head/ neck.

Results: 29 patients were operable (74.3%), 3 had metastases at diagnosis and 7 had locally advanced disease. 28 patients underwent surgery with curative intent; 6 had neoadjuvant radiotherapy and 8 had radiotherapy post op.

75% of patients receiving surgery alone were alive at 4 years. Prognostic factors comparing both groups of patients are shown in table 1. Median OS in patients with NF 1 was 24.5 months compared with 48 months in non NF-1 tumours.

Conclusion: Despite similar standard prognostic features between the two cohorts, patients with NFI-1 had much poorer survival suggesting an intrinsic negative effect on outcome.

86.
THE IMPACT OF PRE-OPERATIVE BILIARY DRAINAGE ON POSTOPERATIVE OUTCOMES IN PATIENTS UNDERGOING SURGERY FOR PANCREATIC CANCER, A RETROSPECTIVE SINGLE CENTRE STUDY

Alfred Adiamah, Vivek Vaidya, Anisa Kushairi, Nick Moody, Dhanny Gomez. *Nottingham Digestive Diseases Centre and National Institute for Health Research (NIHR) Nottingham Biomedical Research Centre, Nottingham University Hospitals NHS Trust, Nottingham, UK*

Background: The optimum management of jaundice in patients with resectable pancreatic cancer remains controversial. Whilst pre-operative biliary drainage is often a helpful bridge to surgery, it reportedly increases the morbidity rate when compared to upfront surgery. This retrospective

study, evaluated postoperative outcomes in this cohort of patients with and without pre-operative biliary drainage.

Methods: All patients who underwent surgery for pancreatic cancer with a curative intent in a single tertiary centre over a 5-year period were included. Patients were stratified into those who underwent pre-operative biliary drainage (endoscopic retrograde cholangio-pancreatography or percutaneous transhepatic cholangiography) and those who received upfront surgery. Information collected included demographic data, biochemistry results and post-operative course. The main outcomes were post-operative complications, length of stay and mortality.

Results: A total of 113 patients undergoing surgery with curative intent met inclusion criteria. There was an equivalence of male and female patients with a mean age of 64 years. The mean Charlson comorbidity index was 4.7 and the mean ASA grade was 1.8. The mean serum bilirubin level was 127. Seventy-eight (69%) patients underwent pre-operative biliary drainage. Biliary drainage was associated with a significant increase in intra-operative blood loss (P=0.005). However, there was no significant difference in post-operative complications, length of stay or mortality.

Conclusion: Pre-operative biliary drainage was performed in two-thirds of patients in this cohort and was associated with a significant risk of intra-operative blood loss. However, it had no impact on the overall post-operative course including post-operative complications, prolonged length of stay or mortality.

BASO~ACS Prize Papers Monday 18th November 2019, 09:00 to 10:00
18.
ORTHOTOPIC LIVER TRANSPLANTATION FOR INTRAHEPATIC CHOLANGIOCARCINOMA: A SYSTEMATIC REVIEW & PROPORTIONAL META-ANALYSIS

William Cambridge[1], Harry Wood[2], Rachel Guest[1]. [1] *University of Edinburgh, Edinburgh, UK;* [2] *University of Nottingham, Nottingham, UK*

Background: Prognosis for intrahepatic cholangiocarcinoma (iCCA) has improved little in recent decades, despite increasing incidence. Initially hypothesised as an ideal treatment option for iCCA, orthotopic liver transplantation (OLT) has been largely abandoned due to the extremely poor survival rates reported by early studies. Recent studies have however reignited the discussion surrounding OLT for iCCA, especially in the setting of 'early' iCCA & when treated with neoadjuvant chemoradiation.

Methods: A search of the MEDLINE, EMBASE, Scopus and Web of Science databases was conducted and data were extracted from relevant studies. A proportional meta-analysis was performed to pool the 1, 3- and 5-year survival and disease recurrence rates, reported following OLT for iCCA.

Results: Eleven studies comprising 215 patients were eligible for final analysis. The pooled 1, 3- and 5-year overall survival rates following OLT were 69.1% (95% CI 56.5 – 79.5), 46.3% (95% CI 34.7 – 58.4) and 37.2% (95% CI 26.6 – 49.3). The pooled recurrence rate post-OLT was 43.3% (95% CI 33.9 – 53.2). Treatment with neoadjuvant chemoradiation prior to OLT resulted in increased long-term survival, whilst finding of iCCA incidentally on explant specimen had no effect on long-term outcomes.

Conclusions: Long term survival outcomes following OLT for iCCA are poor, and disease recurrences rates are high. Although recent studies have shown improved survival when OLT is combined with neoadjuvant therapy, these are limited in scope and number. Superior outcomes have been reported following OLT for 'early' iCCA, these outcomes could potentially be improved further with incorporation of a neoadjuvant treatment protocol.

27.
THE MATRIX METALLOPROTEINASE SYSTEM IN COLORECTAL CANCER PROGRESSION AND 15-YEAR SURVIVAL

Elizabeth Baker, Norma Robinson, Mohamed Tabaqchali, David Leaper. *University Hospital of North Tees, Stockton on Tees, UK*

Background: The matrix metalloproteinase (MMP) system is involved in tumour invasion and metastasis in colorectal and other cancers. The MMP