A regional EUS service using a collaborative network

H M Gordon,¹ D A J Lloyd,¹ A Higginson,² R McCrudden,³ C Bent,³
F W Shek,⁴ R Beable,² A Al-Badri,¹ B Green,⁴ E Jaynes,⁴ B Foria,³
B S F Stacey⁴

¹Department of Gastroenterology, Hampshire Hospitals NHS Foundation Trust, Winchester, UK

²Portsmouth Hospitals NHS Trust, Portsmouth, UK

³Royal Bournemouth and Christchurch Foundation Trust, Bournemouth, UK

⁴University Hospital Southampton NHS Foundation Trust, Southampton, UK

Correspondence to

Dr Harriet Gordon, Consultant Gastroenterologist, The Royal Hampshire County Hospital, Romsey Road, Winchester SO21 3LW, UK; Harriet.Gordon@HHFT.nhs.uk

Received 21 April 2016

Revised 4 July 2016

Accepted 18 July 2016

Published Online First

9 August 2016

ABSTRACT

Endoscopic ultrasound (EUS) is increasingly used in the management of hepatobiliary lesions, allowing staging and tissue acquisition. It is operator-dependent, and fine needle aspiration (FNA) of solid lesions provides an auditable standard; high-volume centres have shown excellent results for solid pancreatic lesion FNA with sensitivities of 92%–97%. The British Society of Gastroenterology guidelines stress that clinical quality should determine service provision, with geographical accessibility a secondary consideration. We set up the Wessex EUS network, working from a single hepatobiliary (HPB) pancreatic multidisciplinary team, with EUS provided in four local centres providing agreed standards and audit. Pancreatic solid lesion FNA results showed a pooled sensitivity of 94%, comparable with high-volume single centres. This demonstrates a network with good clinical governance is a plausible solution to providing a specialist service such as EUS and may be a roadmap that other specialist services under pressure could follow.

Endoscopic ultrasound (EUS) is a specialised procedure combining endoscopy with ultrasound imaging. In keeping with the development of many new techniques, EUS services began with local enthusiasm and developed with regional variation in provision. The lack of structured training and prohibitive costs of equipment delayed the early service provision within the UK compared with other countries.

EUS has now become increasingly used in the diagnosis and management of lesions accessed through the upper and lower gastrointestinal (GI) tract in terms of lesion recognition and staging of malignancy, and by using FNA increasingly in the differentiation of tumour types. Over the last 15 years, in hepatobiliary medicine, EUS has become integral in the

management of pancreatic disease with the assessment of both solid and cystic lesions, pancreatic ductal disease, pancreatitis, cholangiopathy and choledocholithiasis. Pancreatic ductal adenocarcinoma has a mean 5-year survival of 12%–20% following resection, but <1% if unresectable. Only 15%–20% present with resectable disease, and consequently the majority of patients follow a palliative pathway. However, 19% of solid lesions were not adenocarcinoma, but may be prognostically better lesions, such as a neuroendocrine tumour (9% of solid lesions in our series), lymphoma or indeed a manifestation of a benign disease process such as autoimmune pancreatitis. Thus, cytological confirmation of any pancreatic mass is now essential before treatment can be commenced.

EUS is a valuable tool, but it is operator-dependent. The sensitivity of FNA in evaluation of solid pancreatic lesions is emerging as a benchmark key performance indicator for centres providing EUS and for EUS networks. It is a reflection of the endoscopist and clinician or scientist for the processing of FNA and biopsy specimens (if present) and of the cytology and histopathology departments and the reporting pathologists who assess the sample for diagnosis. A British Society of Gastroenterology (BSG) working party published guidelines in 2011 on the service provision and training of EUS in the UK,¹ highlighting the need for quality, with a:

- Balance of geographic accessibility and availability, these considerations being secondary to quality.
- Provision must follow an ability to maintain standards.
- Local mechanisms to monitor, achieve and maintain a service of high quality.

CrossMark

To cite: Gordon HM, Lloyd DAJ, Higginson A, et al. *Frontline Gastroenterology* 2017;**8**:26–28.

The Group envisages that EUS services be commissioned by a cancer network.

UK pancreatic cancer management in the last 10 years has become consolidated within pancreatic centres; there are currently 28 UK pancreatic surgery centres: 20 in England, five in Scotland, two in Wales and one in Northern Ireland. EUS services have been integral within pancreatic centres with a trend in recent years for many smaller volume services to centralise. Centralisation affords pooling of expertise for the whole EUS team, particularly nursing and pathology support, and allows close liaison with the multi-disciplinary team (MDT). However, the process of centralisation frequently fragments a patient's journey and increases patient travel time at a time of stress. The ideal for any region is to provide a high-quality service, but accessible to patients locally, involving their local clinicians. This article describes our practice within a pancreatic network in Wessex.

Wessex has a population of around four million, with the demography consisting of large cities, rural areas and islands including the Channel Islands. The regional pancreatic centre is in Southampton where the weekly regional hepatobiliary MDT takes place, cases are discussed and EUS referrals generated.

The EUS service in Wessex grew from two geographical locations. One at a single centre (Winchester) from 2001 to 2010, for a cancer network covering three mainland hospitals (Winchester, Southampton and Portsmouth), Isle of Wight and Channel Islands. There were four operators from the three mainland hospitals, working in two pairs, who trained and pooled experience together. From 2010, in addition to Winchester (HMG, DAJL), two other hospitals within the network (Southampton (BSFS, HMG, FWS) and Portsmouth (AH, RB)) obtained EUS equipment, and the service devolved to three centres. In each, there was a minimum of two operators; thus, two new trained endoscopists were involved, and one worked in two centres. This secured the goal of a service available locally, each centre with a catchment population of 550 000–1 900 000, but we were concerned about maintaining quality. Separate to this, Bournemouth (RMCC, CB) provided an upper gastrointestinal EUS service from 1999, and by 2011, two clinicians provided the HPB EUS service. Could local endoscopic units provide a high-quality service, working from a single referral point? And would individual endoscopic practitioners potentially compromise quality by possibly performing lower annual numbers than those working in high-volume centres?

We developed the Wessex EUS group to maintain collaboration. This consisted of a total of eight endoscopists working in four centres, all from a common MDT in Southampton: six gastroenterologists and two radiologists. The group also has membership from histopathology/cytology consultants, biomedical technicians and nursing support from each centre.

The group meets every 4 months and report ongoing audit data. Common practice standards are agreed.

We have had an ongoing audit of pancreatic solid lesion FNA sensitivity rates. The sensitivity rates for the 12 months of 2014 for solid pancreatic masses, in which a cancer was suspected, are provided in [table 1](#). This dataset was chosen as it has allowed a minimum of 12 months' follow-up to establish whether those with a negative result for malignancy had in fact had a tumour (false-negative rate). For this report, we have excluded any negative results where clinical follow-up could not be obtained, such as in Channel Island patients. Cystic lesions were excluded.

During 2014, a total of 1207 EUS procedures (upper GI and HPB, diagnostic and interventional, radial and linear) were done across the four centres.

We had a pooled sensitivity of 94%. The majority of lesions were adenocarcinoma, but 19% of malignant lesions had pathology for which the oncological management and prognosis differed from adenocarcinoma: neuroendocrine tumour (10), lymphoma (5), melanoma (2), sarcoma (1), squamous cell tumour (1), spindle cell tumour (2), renal cell metastasis (1).

Meta-analysis of UK centres examining solid lesion EUS FNA tissue acquisition in 4984 patients showed a pooled sensitivity of 85%, increasing to 91% if suspicious atypia was included.² Reported audit data from other centres in the UK and abroad show a variation on solid pancreatic tumour sensitivity. Large centres such as Newcastle (catchment population of 3.3 million) have both pancreatic surgery and EUS services in the same location, and a solid pancreatic lesion FNA sensitivity of 92%, provided by two operators doing four lists each.³ Birmingham has a sensitivity rate of 97%, with 429 procedures per year by a single operator.⁴ Other centres have lower reported sensitivities, 62%–92%, with some centres completing a smaller number of cases per year having lower results.^{5–6} Thus, our data show rates comparable with large-volume centres on one site.

We found that the presence of on-site cytology to prepare samples and provide contemporaneous feedback reduced the number of passes and increased sensitivity, while increasing the speed of feedback for the patient pathway. Rapid on-site evaluation (ROSE) has been shown to be of value in other centres giving a sensitivity of 92%³–95%,⁷ but particularly of benefit to those centres with a smaller volume of patients.⁸ One centre, centre 3 in [table 1](#), used CytoRich Red rather than ROSE, and has had 95%–100% sensitivity using this since 2010.

The value of cytology biomedical scientists and nursing support within the group to pool evidence and best practice was also extremely helpful, and these individuals reported great benefit from peer support. Additionally, the group provided support for research training development within the region.

In summary, a significant number of lesions will not be primary pancreatic adenocarcinoma, but represent

Table 1 Pooled data from four EUS endoscopy centres for solid pancreatic lesion EUS-FNA

	Number of solid pancreatic masses sampled	Number of malignancy/significant atypia confirmed	False negative for malignancy on clinical/radiological findings	True negative for malignancy on clinical/radiological findings	Sensitivity (%)
Centre 1	31	29	1	1	97
Centre 2	34	25	4	5	86
Centre 3	33	25	0	8	100
Centre 4	48	36	2	10	95
Total	146	115	7	24	94

EUS, Endoscopic ultrasound.

other malignant diseases which may carry a more favourable prognostic outlook such as a neuroendocrine tumour (9% of solid lesions in our series), lymphoma or metastatic disease or indeed as a manifestation of a benign disease process such as autoimmune or chronic pancreatitis. Where clinically appropriate, pancreatic mass lesions should therefore be considered for EUS-guided tissue acquisition. For pancreatic solid lesions, the EUS network highlights a regional sensitivity of 94% which is comparable with the published results from a single large-volume UK

EUS centre.³ This model of working from a common weekly HPB MDT and meeting as a specific EUS group three times a year could be replicated to other centres in geographically separate areas. We have provided a service locally available to a population of four million, and also had the framework to set and monitor standards with collaboration and support for the whole EUS team, meeting the criteria set by the BSG.

Contributors Conception of study Wessex Network EUS Group. Contributions to the article, revision of the manuscript and approval of final manuscript: all authors.

Funding An educational grant facilitating meeting rooms for the group was kindly provided by Cook Medical.

Competing interests None declared.

Provenance and peer review Not commissioned; externally peer reviewed.

Significance of this study

What is already known on this topic?

- ▶ Endoscopic ultrasound (EUS) FNA is an accurate and safe modality for biopsy of solid pancreatic lesions.
- ▶ FNA of solid lesions is an emerging key performance indicator of a EUS service as a whole, as it provides a simple auditable standard.

What this study adds?

- ▶ For pancreatic solid lesions, the Wessex UK EUS network highlights a regional sensitivity of 94% which is comparable with the published results from single high-volume centres.
- ▶ Small-volume centres that work together as a network sharing good practice have the capability of performing to a comparable level of larger single high-volume centres.
- ▶ A EUS network has the potential to fulfil the desired service provision outlined by the British Society of Gastroenterology, which in turn may provide a useful model for populations which are located in challenging geographical service locations.

How might it impact on clinical practice in the foreseeable future?

- ▶ New technologies, their associated learning curves and local quality service improvements can be discussed, shared and audited within a network.
- ▶ Other auditable outcomes can be explored to highlight good practice.

REFERENCES

- 1 Meenan J, Harris K, Oppong K, *et al.* Service provision and training for endoscopic ultrasound in the UK. *Frontline Gastroenterol* 2011;2:188–94.
- 2 Hewitt MJ, McPhail MJW, Possamai L, *et al.* EUS-guided FNA for diagnosis of solid pancreatic neoplasms: a meta-analysis. *Gastrointest Endosc* 2012;75:319–31.
- 3 Oppong KW, Richardson DL, Charnley RM, *et al.* The development and evolution of a tertiary pancreaticobiliary endoscopic ultrasound service: lessons learned. *Frontline Gastroenterol* 2011;2:66–70.
- 4 Cherian PT, Mohan R, Douiri A, *et al.* Role of endoscopic ultrasound-guided fine-needle aspiration in the diagnosis of solid pancreatic and peripancreatic lesions: is onsite cytopathology necessary? *HPB (Oxford)* 2010;12:389–95.
- 5 Caglar E, Senturk H, Atasoy D, *et al.* The role of EUS and EUS-FNA in the management of pancreatic masses: five-year experience. *Hepatogastroenterology* 2013;60:896–9.
- 6 Mosteiro L, Corominas-Cishek A, Muniz G, *et al.* Ultrasound-guided endoscopic fine needle aspiration cytology in pancreatic lesions: a series of 43 cases with histologic correlation from a single institution. *Anal Quant Cytopathol Histopathol* 2014;36:9–14.
- 7 Chen J, Yang R, Lu Y, *et al.* Diagnostic accuracy of endoscopic ultrasound-guided fine-needle aspiration for solid pancreatic lesion: a systematic review. *J Cancer Res Clin Oncol* 2012;138:1433.
- 8 Hikichi T, Irisawa A, Bhutani MS, *et al.* Endoscopic ultrasound-guided fine-needle aspiration of solid pancreatic masses with rapid on-site cytological evaluation by endosonographers without attendance of cytopathologists. *J Gastroenterol* 2009;44:322–8.