BEST EVIDENCE TOPIC REPORTS

Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary

Edited by Simon D Carley

Emerg Med J 2007;**24**:492–496. doi: 10.1136/emj.2007.050500

Best Evidence Topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practising clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. Each BET is based on a clinical scenario and ends with a clinical bottom line which indicates, in the light of the evidence found, what the reporting clinician would do if faced with the same scenario again.

The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary¹ or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.² The BETs shown here together with those published previously and those currently under construction can be seen at <http://www.bestbets.org>.³ Four BETs are included in this issue of the journal.

- ▶ Use of ultrasonography for lumbar puncture
- ▶ Routine chest x rays following bronchoscopy guided percutaneous dilational tracheostomy
- ▶ Using the ultrasound compression test for deep vein thrombosis will not precipitate a thromboembolic event
- ▶ Prophylaxis of venous thromboembolism in patients with lower limb plaster cast immobilisation

1. Carley SD, Mackway-Jones K, Jones A, *et al*. Moving towards evidence based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;**15**:220–2.

2. Mackway-Jones K, Carley SD, Morton RJ, *et al*. The best evidence topic report: A modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;**15**:222–6.

3. Mackway-Jones K, Carley SD. [bestbets.org](http://www.bestbets.org): odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;**17**:235–6.

Use of ultrasonography for lumbar puncture

Report by Trevor Cummings, *Emergency Medicine Resident*

Checked by Jeffrey S Jones, MD, *Emergency Medicine Research Director*

Grand Rapids Medical Education & Research/
Michigan State University, Michigan, USA

doi: 10.1136/emj.2007.050518

www.emjonline.com

Abstract

A short cut review was carried out to establish whether ultrasonography can assist in the performing of a lumbar puncture. Fifty-one citations were reviewed of which three answered the three part question. The clinical bottom line is that ultrasound shows early promise as a tool to assist in achieving a successful lumbar puncture.

Three part question

In [patients requiring lumbar puncture (LP)], is [ultrasonography assisted LP better than landmark technique] for [increasing chances of successful specimen collection]?

Clinical scenario

A patient presents to the emergency department with fever, headache, and neck stiffness. You feel a lumbar puncture is a necessary part of the patients work up; can bedside ultrasonography assist in specimen collection?

Search strategy

Medline 1966-05/07 using the OVID interface, Cochrane Library (2007), PubMed clinical queries: [(exp ultrasonography OR ultrasound.mp) AND (exp lumbar puncture OR lumbar puncture.mp)]. LIMIT to human AND English.

Search outcome

Fifty-one papers found of which only three were relevant (table 1).

Comment(s)

All studies found ultrasound clinically useful. Two studies had similar design in that they were assessing ability to identify appropriate landmarks. However, their results should be considered preliminary as it may not translate into increased rates of success, diminished complication rates for the procedure, or other secondary end points related to lumbar puncture. Coley's study shows us that ultrasound can not only be used in real time for cerebrospinal fluid collection but can also be a tool to diagnose cause of failed collection and to identify those in which attempting collection may be futile.

▶ CLINICAL BOTTOM LINE

Ultrasound shows early promise as a tool to assist in achieving a successful lumbar puncture.

Coley BD, Shiels WE, Hogan MJ. Diagnostic and interventional ultrasonography in neonatal and infant lumbar puncture. *Pediatr Radiol* 2001;**31**:399–402.

Ferre RM, Sweeney TW. Emergency physicians can easily obtain ultrasound images of anatomical landmarks relevant to lumbar puncture. *Am J Emerg Med* 2007;**25**:291–6.

Stiffler KA, Jwayyed S, Wilber ST, *et al*. The use of ultrasound to identify pertinent landmarks for lumbar puncture. *Am J Emerg Med* 2007;**25**:331–4.

Table 1

Author, date, country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Coley <i>et al</i> , 2001, USA	Neonates and infants referred for image-guided LP after unsuccessful blind attempts. 32 patients enrolled	Prospective	Diagnosis of the cause of failed LP when failure has occurred and assessment on whether US can provide guidance for LP	23 US studies showed intrathecal and/or epidural echogenic haematoma, 5 showed minimal fluid, and 4 had normal exams. US guidance used 26 times. US guidance provided usable samples in 15 of 26 attempts. In 11 encounters where thecal sac appeared normal with CSF visible, US was always successful. In 6 encounters where minimal or bloody CSF present, provided usable samples in 4	Did not compare cause of failed LP found by US versus some other standard imaging study. Did not compare success of LP with US to fluoroscopy
Ferre <i>et al</i> , 2007, USA	76 patients were enrolled after exclusion criteria. A convenience sample of ED patients were used at an academic referral centre with an emergency medicine residency training programme	Prospective, observational trial	Two EPs sought to identify relevant anatomy in emergency patients. Visualisation time for 5 anatomical structures (spinous processes or laminae, ligamentum flavum, dura mater, epidural space, subarachnoid space), BMI, and perception of landmark palpation difficulty were recorded	Soft tissue and bony anatomical structures were identified in all subjects. Mean BMI was 31.4 (95% confidence interval 29.1 to 33.6). High-quality images were obtained <1 min in 153 (87.9%) scans and in <5 min in 174 (100%) scans. Mean (SD) acquisition time was 57.19 (68.14) s; range 10–300 s	Data were obtained by 2 EPs who were working independently. There was no third party to check or verify data. Population was a convenience sample, not actual adults undergoing LP
Stiffler <i>et al</i> , 2007, USA	The study enrolled a convenience sample of eligible patients at an ED. 62 patients were enrolled after exclusion criteria.	Prospective cross-sectional study	Calculated the BMIs of eligible patients and then categorised them as normal (BMI <24.9), overweight (BMI 24.9–30), or obese (BMI ≥30). We recorded the difficulty in palpating traditional LP landmarks. Identification and measurement of the spatial relationships of the sacrum; spinous processes of lumbar vertebrae L3, L4, and L5; ligamentum flavum; and the spinal canal by US was attempted	Successful identification of pertinent structures (L4–L5 spinous processes and the spinal canal) occurred in 100% of patients with normal BMI, 95% of those who were overweight, and 74% of those who were obese. Difficulty in palpating landmarks was noted in 5% of patients with normal BMI, 33% of those who were overweight, and 68% of those who were obese. In subjects with difficult-to-palpate landmarks, US identified pertinent structures in 16 of 21. The average distance from skin to ligamentum flavum was 44 mm in those with normal BMI, 51 mm in those who were overweight, and 64 mm in those who were obese; measurements between spinous processes did not vary by BMI. Overall, there was a moderate correlation (0.62) between BMI and the distance from skin to ligamentum flavum	Population was a convenience sample of adult patients at the ED, not patients undergoing an actual LP. Data not reviewed nor verified by a third party

BMI, body mass index; CSF, cerebrospinal fluid; ED, emergency department; EPs, emergency physicians; LP, lumbar puncture; US, ultrasound.

Routine chest x rays following bronchoscopy guided percutaneous dilational tracheostomy

Report by Souvik Das, *SHO*

Checked by Mick Jennings, *Consultant*

Lewisham University Hospital, London, UK

doi: 10.1136/emj.2007.050526

Abstract

A short cut review was carried out to establish whether routine chest x rays are required following bronchoscopy guided percutaneous dilational tracheostomy (PDT). A total of 393 citations were reviewed of which six answered the three part question. The clinical bottom line is that at present there is no clinical evidence to support routine postprocedure chest x ray following bronchoscopy guided percutaneous dilational tracheostomy.

Three part question

In [patients who have undergone bronchoscopy guided percutaneous dilational tracheostomy in intensive care] is a [routine chest x ray necessary] to [rule out immediate postoperative complications like pneumothorax, pneumomediastinum or malposition of tube].

Clinical scenario

In the intensive care unit, a bronchoscopy guided PDT was performed. There were no clinical signs to suggest immediate postoperative complications like pneumothorax, pneumomediastinum or malposition of the tracheostomy tube. You wonder whether a chest x ray is appropriate to rule out the above mentioned complications.

Search strategy

Medline 1966–05/07 using the Ovid interface: [percutaneous.mp. OR seldinger.mp.] AND [tracheostomy.mp. OR exp tracheostomy/ OR tracheostom\$.mp.. OR exp tracheotomy/] AND [exp postoperative complications/OR complications.mp.] LIMIT to human.