

BEST EVIDENCE TOPIC REPORTS

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

Edited by S D Carley

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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.

- ▶ Incision and drainage preferable to oral antibiotics in acute paronychia nail infection?
- ▶ No evidence found that a femoral nerve block in cases of femoral shaft fractures can delay the diagnosis of compartment syndrome of the thigh
- ▶ How to immobilise after shoulder dislocation?
- ▶ Cricoid pressure in emergency rapid sequence induction

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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.

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Incision and drainage preferable to oral antibiotics in acute paronychia nail infection?

Report by Jonathan Shaw, *Specialist Registrar*
Checked by Richard Body, *Clinical Research Fellow*
doi: 10.1136/emj.2005.030163

Abstract

A short cut review was carried out to establish whether incision and drainage or antibiotics was best for acute paronychia. No relevant papers were found using the reported search. There is currently no evidence that oral

antibiotics are any better or worse than incision and drainage for acute paronychia.

Three part question

In [a patient with an acute paronychia nail infection] is [incision and drainage superior to oral antibiotics] in [settling infection]?

Clinical scenario

A healthy 22 year old lady attends the emergency department complaining of a painful, red finger, which she says has come on over a couple of days. Examination reveals erythema to the side of her fingernail with a suggestion of a slight yellow centre. You diagnose an acute paronychia, but wonder whether to prescribe her a course of oral antibiotics or formally incise and drain the suspected collection.

Search strategy

Medline 1966 to February 2005 using the OVID interface: [(exp Paronychia/OR paronychia\$.af. OR felon\$.af. OR whitlow\$.af. OR (finger ADJ infect\$.mp. OR (digit\$ ADJ infect\$.mp. OR (nail ADJ infect\$.mp.]) AND [incision adj drainage.mp. OR drainage.af. OR exp drainage/OR incis\$.af. OR i&d.af. OR surg\$.af.]) AND [antibiotic\$.af. OR exp Antibacterial agents/OR antibacterial\$.af. OR antimicrobial\$.af. OR antiinfective\$.af. OR anti-biotic\$.af. OR anti-microbial\$.af. OR anti-infective\$.af.]. Embase 1974 to February 2005: [exp paronychia/OR paronychia\$.af. OR felon\$.af. OR whitlow\$.af.] AND [exp incision/OR incis\$.af. OR incision.af. OR drainage.af. OR exp surgical-drainage/OR exp percutaneous-drainage/] AND [antibiotics OR exp antibiotic-agent/OR exp anti-biotic-therapy/OR exp anti-infective agent/OR antibacterial\$.af. OR antimicrobial\$.af. OR antibiotic\$.af. OR anti-biotic\$.af. OR anti-bacterial\$.af. OR anti-infective\$.af. OR anti-microbial\$.af.]. Cochrane Library 2005 Issue 1: Paronychia* OR felon* OR whitlow*.

Search outcome

Medline: 73 papers, none relevant. Embase: 61 papers, none relevant. Cochrane: 72 papers, none relevant.

Relevant paper(s)

There were no relevant papers.

Comment(s)

It seems to be generally accepted practice in emergency medicine that any paronychia infection with an apparent area of pus requires incision and drainage, which is painful for the patient and time consuming for the clinician. In contrast, we regularly see patients who have failed treatment with antibiotics prescribed by other departments or primary care. There is currently no evidence that surgical management confers any advantage over oral antibiotics for the treatment of paronychia. A well-designed comparative trial may help to elucidate whether the traditional surgical

approach actually leads to superior outcome. Currently our practice is to incise and drain if pus is present.

► CLINICAL BOTTOM LINE

There is currently no evidence that oral antibiotics are any better or worse than incision and drainage for acute paronychia.

No evidence found that a femoral nerve block in cases of femoral shaft fractures can delay the diagnosis of compartment syndrome of the thigh

Report by George Karagiannis, *Medical student*

Checked by Richard Hardern, *Consultant*

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Abstract

A short cut review was carried out to establish whether a femoral nerve block may mask the signs and symptoms of thigh compartment syndrome. No relevant papers were found using the reported search. There is no evidence to associate a femoral nerve block with a delayed or missed diagnosis of compartment syndrome.

Three part question

In [adults with suspected femoral shaft fracture] is there an association between [pain relief with femoral nerve block] and [delayed or missed diagnosis of compartment syndrome]?

Clinical scenario

A 30 year old man is brought into accident and emergency following a bicycle accident. He is complaining of agonising pain in his right thigh. On examination his thigh is very swollen and any attempt to move it is extremely painful. You suspect a femoral shaft fracture and want to administer some strong analgesia and a splint and send him for an *x* ray. The orthopaedic registrar complains that a femoral block could potentially mask the symptoms of a compartment syndrome. You are wondering if there is any evidence to support this.

Search strategy

Medline(R) 1966 to July 2005 using the OVID interface: [{exp Nerve Block/or exp Anesthesia, Local/or exp Anesthetics, Local/or exp BUPIVACAINE/or exp LIDOCAINE/or exp PRILOCAINE/or (nerve\$ and block\$).mp. or (an?esthe\$ and local).mp. or (an?esthe\$ and block\$).mp. or BUPIVACAINE\$.mp. or (LIDOCAINE\$ or LIGNOCAINE\$).mp. or PRILOCAINE\$.mp. or (regional and an?esthe\$).mp. or (regional and block\$).mp. or (regional and analgesia).mp. or (local and analgesia).mp.}] AND {exp Femoral Fractures/or (exp thigh/and exp fracture/) or (fem#r\$ and fracture\$).mp. or (thigh and fracture\$).mp.} AND {exp Compartment Syndrome/or (compartment\$ and syndrome\$).mp. or (volkmann\$ and contracture\$).mp.}] LIMIT to human AND English. Embase 1980 to July 2005 using the OVID interface: [{exp Nerve Block/or exp Anesthesia, Local/or exp Anesthetics, Local/or exp BUPIVACAINE/or exp LIDOCAINE/or exp PRILOCAINE/or (nerve\$ and block\$).mp. or (an?esthe\$ and local).mp. or (an?esthe\$ and block\$).mp. or BUPIVACAINE\$.mp. or (LIDOCAINE\$ or LIGNOCAINE\$).mp. or PRILOCAINE\$.mp. or (regional and an?esthe\$).mp. or

(regional and block\$).mp. or (regional and analgesia).mp. or (local and analgesia).mp.}] AND {exp Femoral Fractures/or (exp thigh/and exp fracture/) or (fem#r\$ and fracture\$).mp. or (thigh and fracture\$).mp.} AND {exp Compartment Syndrome/or exp Volkmann Contracture/or (compartment\$ and syndrome\$).mp. or (volkmann\$ and contracture\$).mp.}] LIMIT to human AND English. All EBM Reviews (Cochrane DSR, ACP Journal Club, DARE, and CCTR) using the OVID interface: [{((nerve\$ and block\$) or (an?esthe\$ and local) or (an?esthe\$ and block\$) or BUPIVACAINE\$ or (LIDOCAINE\$ or LIGNOCAINE\$) or PRILOCAINE\$ or (regional and an?esthe\$) or (regional and block\$) or (regional and analgesia) or (local and analgesia)).mp.} AND {((fem#r\$ and fracture\$) or (thigh and fracture\$).mp.} AND {((compartment\$ and syndrome\$) or (volkmann\$ and contracture\$).mp.}] LIMIT to human AND English.

Search outcome

Altogether three papers were found in Medline, six in Embase and one in all EBM, of which none were relevant.

Relevant paper(s)

No relevant papers were found.

Comment(s)

No reliable evidence or any official guidance has been found to contraindicate the administration of a femoral block. In theory, pain disproportionate to the injury is thought to be the most important indicator of acute compartment syndrome in awake patients. However the diagnostic value of this sign is doubtful since the fracture as such can cause intolerable pain. Strong analgesia at this point will allow for a relatively painless application of a splint which in turn will provide adequate immobilisation of the limb. With the splint in place it is easier and less painful to transfer and position the patient in the *x* ray department. Plus it is thought to reduce haematoma formation.

► CLINICAL BOTTOM LINE

There is no evidence of an association between a femoral nerve block with a delayed or missed diagnosis of compartment syndrome.

Acknowledgement

The authors would like to thank Mr Chris Phillips, Consultant, for his guidance in preparing this BET.

Mithofer K, Lhowe DW, Vrahas MS, *et al*. Clinical spectrum of acute compartment syndrome of the thigh and its relation to associated injuries. *Clin Orthop Relat Res* 2004; (425):223–9.

Keany JE. Fractures, Femur. www.emedicine.com/emerg/topic193.htm (accessed 13 September 2005).

How to immobilise after shoulder dislocation?

Report by Lennard Funk, *Consultant*

Checked by Martin Smith, *Consultant*

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Abstract

A short cut review was carried out to establish the best way to immobilise dislocated shoulders after reduction. A total of 47 papers were identified using the reported search, of which four represent the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results,

and study weaknesses of these best papers are tabulated. For patients with a first anterior shoulder dislocation immobilisation in external rotation may be of more benefit than immobilisation in internal rotation.

Three part question

[In patients with primary anterior shoulder dislocation] is [immobilisation in internal or external rotation] better at [reducing redislocation rates]?

Clinical scenario

A 25 year old man presents to the emergency department with a first left anterior shoulder dislocation. This is reduced satisfactorily under sedation. You decide to put the patient in a collar and cuff in internal rotation (as you have always done). However, your emergency department physiotherapist suggests that it should be placed in external rotation. You wonder why?

Search strategy

Medline 1966 to June 2005 using the OVID interface; Embase 1996 to week 31, 2005: [shoulder dislocation.mp. or exp Shoulder Dislocation/] and [exp Immobilization/or immobilisation.mp. or exp Casts, Surgical/] and [external.af.]. Cochrane 2005, Issue 3: "shoulder dislocation external".

Search outcome

Medline: 15 papers found of which four were relevant (table 1). Embase: nine papers found, no new references found. Cochrane: 23 citations, no new references found.

Comment(s)

Standard teaching has been to immobilise patients with anterior shoulder dislocations in internal rotation, typically using a collar and cuff system. These interesting studies question this perceived wisdom and suggest that external rotation may be a better position. There is only one clinical study here that suggests good results, though the follow up for the clinical study was short and the position of external

rotation immobilisation may not achieve such good compliance in clinical practice.

► CLINICAL BOTTOM LINE

For patients with a first anterior shoulder dislocation immobilisation in external rotation may be of more benefit than immobilisation in internal rotation.

Itoi E, Hatakeyama Y, Urayama M, *et al.* Position of immobilization after dislocation of the shoulder. A cadaveric study. *J Bone Joint Surg (Am)* 1999;**81**:385–90.

Itoi E, Sashi R, Minagawa H, *et al.* Position of immobilization after dislocation of the glenohumeral joint. A study with use of magnetic resonance imaging *J Bone Joint Surg (Am)* 2001;**83-A**:661–7.

Itoi E, Hatakeyama Y, Kido T, *et al.* A new method of immobilization after traumatic anterior dislocation of the shoulder: a preliminary study. *J Shoulder Elbow Surg* 2003;**12**:413–15.

Miller BS, Sonnabend DH, Hatrick C, *et al.* Should acute anterior dislocations of the shoulder be immobilized in external rotation? A cadaveric study. *J Shoulder Elbow Surg* 2004;**13**:589–92.

Cricoid pressure in emergency rapid sequence induction

Report by John Butler, *Consultant*
Checked by Ayan Sen, *Clinical Fellow*

doi: 10.1136/emj.2005.030205

A short cut review was carried out to establish cricoid pressure reduced aspiration during rapid sequence induction (RSI) of anaesthesia. A total of 241 papers were identified using the reported search, of which three represented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. There is little evidence to support the widely held belief that the application of cricoid pressure reduces the incidence of aspiration during a rapid sequence intubation.

Table 1

Author, date, and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Itoi E <i>et al.</i> , 1999, Japan	Cadaveric study. Ten thawed fresh-frozen cadaveric shoulders with all of the muscles removed. A simulated Bankart lesion was created. Linear transducers attached to the antero-inferior and inferior portions of the Bankart lesion, the opening and closing of the lesion were recorded with the arm in 0, 30, 45, and 60 degrees of elevation in the coronal and sagittal planes as well as with the arm in rotation from full internal to full external rotation in 10 degree increments	Laboratory trial	Position of Bankart lesion to glenoid	The best coapted positions were: (1) adduction plus full internal rotation to 30 degrees of external rotation; and (2) 30 degrees of flexion or abduction, neutral, and internal rotation	Cadaveric. Theoretical rather than actual clinical outcome
Itoi E <i>et al.</i> , 2001, Japan	19 patients with shoulder dislocations. Magnetic resonance imaging, with the arm held at the side of the trunk and positioned first in internal rotation (mean, 29 degrees) and then in external rotation (mean, 35 degrees), in 19 shoulders	Prospective study	Position of Bankart lesion to glenoid	Separation and displacement of the labrum were both significantly less ($p=0.0047$ and $p=0.0017$, respectively) when the arm was in external rotation than when it was in internal rotation	13 shoulders were recurrent dislocations and 6 acute, thus not same
Itoi E <i>et al.</i> , 2003, Japan	40 patients with initial shoulder dislocations. Randomised into internal rotation (IR) immobilisation and external rotation (ER) immobilisation	Prospective, randomised study	Recurrent dislocation rate	The recurrence rate was 30% in the IR group and 0% in the ER group at a mean 15.5 months	Early results. Immobilisation position may achieve less compliance in clinical practice
Miller BS <i>et al.</i> , 2005, Australia	10 cadaveric shoulder girdles stripped of major muscles (but rotator cuff intact) and a surgical Bankart lesion fashioned. Contact force was measured between glenoid and humerus in a variety of positions	Laboratory trial	Contact forces in different positions	No contact force in internal rotation. Maximum contact force when arm at 45 degrees of external rotation	Cadaveric. Does not take account of other damage that may occur following a dislocation. Theoretical rather than clinical outcome

Three part question

In [patients undergoing emergency RSI] does [cricoid pressure] reduce the [incidence of aspiration of gastric contents/ morbidity/mortality]?

Clinical scenario

You are about to perform an RSI in a 26 year old man with a severe head injury. You have been told that the gentleman has consumed a significant amount of alcohol in the last three hours. The nurse asks you whether application of cricoid pressure will stop him aspirating.

Search strategy

Medline 1950 to July 2005 via OVID; Embase 1988 to July 2005 via OVID: [{Sellick's manoeuvre.mp} OR {Cricoid pressure.mp} OR/cricoid pressure] LIMIT to HUMAN and ENGLISH and ABSTRACTS. *Cochrane Database of Systematic Reviews* 2005.

Search outcome

Medline: 241 papers in total of which 3 papers were relevant to the question (table 2). Embase: 119 citations, no new references found. Cochrane: No new papers found.

Comment(s)

Cricoid pressure has been described as the "linchpin of rapid sequence induction" and has become widely accepted as the standard of practice during anaesthesia in the UK and USA.

However, it is not widely used in some continental countries. Although it is a simple manoeuvre there have been concerns about its safety and efficacy. Opinion on its use varies widely from those who believe it should remain the standard of care to those who urge for re-evaluation of the technique. Concern has been expressed that cricoid pressure may interfere with airway management, obscuring the laryngeal view and creating difficulties in passing the endotracheal tube. This may lead to a failure of airway techniques and subsequent morbidity and mortality. The evidence presented in this review suggests that none of the papers confirm the perceived clinical benefit of cricoid pressure in reducing the incidence of aspiration during an emergency RSI.

It will be interesting to see whether a technique that is now so widely engrained in anaesthetic practice will ever be submitted to a more rigorous evaluation.

► CLINICAL BOTTOM LINE

There is little evidence to support the widely held belief that the application of cricoid pressure reduces the incidence of aspiration during a rapid sequence intubation.

Sellick BA. Cricoid pressure to control regurgitation of stomach contents during induction of anaesthesia. *Lancet* 1961;**2**:404–6.

Brimacombe JR, Berry AM. Cricoid pressure. *Can J Anaesth* 1997;**44**:414–25.

Smith KJ, Dobranowski J, Yip G, et al. Cricoid pressure displaces the esophagus: an observational study using magnetic resonance imaging. *Anesthesiology* 2003;**99**:60–4.

Table 2

Author, date, and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Sellick BA, 1961, UK	26 high risk anaesthesia cases in which cricoid pressure was applied	Observational study	Incidence of reflux of gastric/oesophageal contents when cricoid pressure released post-intubation of trachea	In 3 out of 26 cases release of cricoid pressure was followed by immediate reflux of gastric contents into pharynx	Observational study in few patients. Study conducted in 1961 using anaesthetic techniques available at that time
Brimacombe JR and Berry AM, 1997, Canada	Clinical and cadaver studies	Meta-analysis	Evidence of aspiration	No high quality studies proving that cricoid pressure is beneficial in preventing aspiration	No search strategy given
			Airway patency	Some studies report acid aspiration despite cricoid pressure	No inclusion criteria
			Upper oesophageal sphincter pressure	Some reports of cricoid pressure impeding airway patency	No assessment of quality of studies
			Gastric insufflation with BVM	Some evidence suggesting cricoid pressure increases upper oesophageal sphincter pressure	Various outcome measures used
			Airway/soft tissue injury	Some evidence that cricoid pressure reduces gastric insufflation during BVM	No definitions for aspiration pneumonia given
Smith KJ <i>et al</i> , 2003, Canada	22 healthy volunteers	Observational study. MRI scans of necks were taken with and without the application of cricoid pressure	Oesophageal displacement laterally relative to the cricoid without cricoid pressure	Case reports of cricoid injury/soft tissue injury 52.6% of cases	Healthy awake volunteers were used, not paralysed patients undergoing RSI.
			Oesophageal displacement laterally relative to the cricoid with cricoid pressure	90.5% of cases	Findings may be influenced by muscle tone and the swallowing reflex
			Unopposed oesophagus without cricoid pressure.	47.4% of cases	
			Unopposed oesophagus with cricoid pressure.	71.4% of cases	
			Lateral laryngeal displacement	66.7% of cases	
			Airway compression	81% of cases	

BVM, bag-valve-mask; RSI, rapid sequence intubation.