LETTERS TO THE EDITOR

Best evidence topic reports: fracture of the clavicle

EDITOR,—The article concerning the treatment of simple fractures of the clavicle, based on best evidence, is unhelpful and potentially misleading.[1] This search highlights the lack of evidence comparing the use of collar and cuff with broad arm sling in the treatment of fracture of the clavicle. Unfortunately some clinicians may infer from this, incorrectly, that both treatments are equally acceptable.

The issue of treatments for fracture of the clavicle can be approached sensibly from a biomechanical point of view. Simple biomechanics dictate that a sling, which provides support, is the treatment of choice. In fact any device that elevates the shoulder (such as double collar and cuff) is acceptable, whereas a single collar and cuff, which provides traction, will distract the fracture, increase displacement, put more tension on the skin overlying the fracture site, and certainly cause a great deal of discomfort. The only potential disadvantage of a sling is that it may directly impinge upon the fracture site.

While we should strive towards evidence based practice it is important that the right questions are addressed: in this instance this has not been achieved. This particular search has been an unnecessary paper exercise and has not contributed in anyway to the rational treatment of fracture of the clavicle.

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1 Carley S, Mackway-Jones K (Mackway-Jones K, ed). Collar and cuff or sling after fracture of the clavicle. *J Accid Emerg Med* 1999;**16**:140.

Best evidence topic reports: fracture of the clavicle

EDITOR,—I have always found the best evidence topic reports in the journal to be informative and valuable, so much so that we present them to our students as good examples of a questioning approach to accident and emergency practice. I was, however, concerned to find one example recently which was completely illogical. The comparison of collar and cuff or sling after fracture of the clavicle by Dr Simon Carley and Dr Kevin Mackway-Jones[1] may mislead some readers of the journal into thinking that a collar and cuff is an acceptable treatment for fractures of the clavicle.

The deformity in fractures of the mid-shaft of the clavicle is caused by two factors, firstly the upward pull of the sternocleidomastoid muscle on the medial half of the clavicle, and secondly the effect of gravity pulling down the shoulder and the attached distal half of the clavicle. To overcome this deformity, the elbow must be supported, whereas the use of a standard collar and cuff produces the opposite effect. Collar and cuff slings are very useful in treating fractures of the upper humerus, for which "natural traction" is required, but the use of such a sling in clavicular fracture would

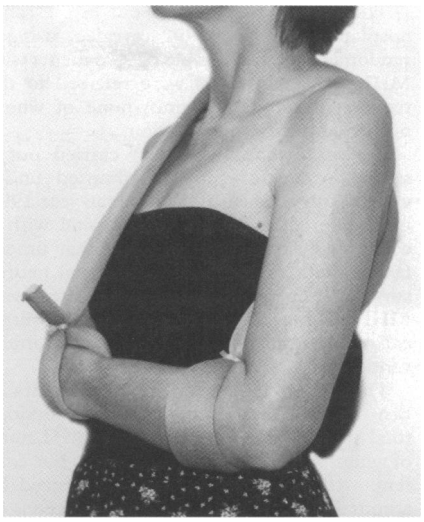

Figure 1 Double collar and cuff or Maudsley sling.

predictably cause an increase in deformity and unnecessary pain and suffering. I have been unable to find any reference in textbooks or other literature to suggest that anyone has ever advocated the use of collar and cuff for the treatment of clavicular fractures.

There is, however, an alternative type of collar and cuff sling, known as the double collar and cuff or Maudsley sling, which offers elbow support just like the broad arm sling, but which has significant advantages in terms of patient comfort and mobility. The broad arm sling has the disadvantage of completely covering the upper limb to which it is applied, and additionally it may apply direct pressure over the site of a clavicular fracture. The double collar and cuff does not cross the fracture site, and allows more access to the arm for washing and dressing (fig 1).

The authors may be correct that there is no literature comparing the use of collar and cuff or sling in simple clavicular fracture, but perhaps this is to be expected because the right question was not asked. Readers are left with an unsatisfactory conclusion and an impression that "local advice" might legitimately include the use of a collar and cuff for clavicular fracture. It would, perhaps, have been of more benefit to compare the efficacy of the broad arm sling and figure-of-eight bracing, since I am sure that most of the readers of this journal would not have seen the evidence for and against laid out in the skilful way normally adopted by the series authors.

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1 Carley S, Mackway-Jones K (Mackway-Jones K, ed). Collar and cuff or sling after fracture of the clavicle. *J Accid Emerg Med* 1999;**16**:140.

Best evidence topics reports: shaft of humerus fractures

EDITOR,—The best evidence topic report on the above by Drs K Herren and S Carley may cause misunderstanding among some readers.[1] It is not clear whether they are discussing broad arm sling/collar and cuff (sling supports) in conjunction with a primary plaster support or the sling supports just on their own in an uncomplicated shaft of humerus injury.

If the former were the case, then it is collar and cuff which definitely has a greater mechanical advantage.[2] The two common methods of plaster support in these fractures are either hanging arm cast[3] or the coaptation splint[4] (commonly called U slab/sugar tong splint).

The distinct advantages of using a collar and cuff are that by adjusting the length (or the "drop") of the sling one can correct the anteroposterior angulation—shortening corrects the anterior angulation while lengthening corrects the posterior angulation. Placing the loop of the cuff on the dorsal aspect of the wrist corrects the lateral angulation and placement of the same on the volar aspect of the wrist corrects the medial angulation. While a broad arm sling can definitely provide a support, it does lack the finer advantages provided by the collar and cuff.

There is no scientific basis for discussion of management/prognosis of these fractures treated just with cuff and collar or broad arm sling. It is not a surprise that particular evidence is lacking on a literature search based on the entry criteria in the report.

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1 Herren K, Carley S (Mackway-Jones K, ed). Support for uncomplicated shaft of humerus fractures. *J Accid Emerg Med* 1999;**16**:141.
2 Rockwood CA, Green DP. *Fractures in adults*. Vol I. 2nd Ed. Philadelphia: JB Lippincott, 1984: 655–61.
3 Caldwell JA. Treatment of the fractures of the shaft of humerus by hanging cast. *Surg Gynaecol Obstet* 1940;**70**:421.
4 Charnley J. *The closed treatment of common fractures*. Baltimore: Williams & Wilkins, 1961.

Kevin Mackway-Jones replies

I am grateful for the opportunity to reply to the letters that comment on the best evidence topic reports (BETs) about the support of upper limb fractures.[1 2] These letters argue that the outcomes of the literature reviews are at best irrelevant and at worst misleading. The letters argue for particular treatments on biomechanical grounds, and the authors clearly have well formed views about how these fractures are best managed.

The two BETs were not undertaken for purely academic reasons. As previously reported BET topics are selected because they seek to answer questions that arise in clinical practice.[3] In both instances junior staff had been told to instigate the alternative treatments being considered (broad arm sling or collar and cuff) by different specialists at different times. Each specialist had "good reasons" for the advice they gave and each felt that their advice offered the best approach to care. The BETs were undertaken to establish what evidence there was for this conflicting advice.

The fact that rigorously applied searches revealed no evidence does not imply that one or other of the alternatives is not the best, but rather that there is no direct comparative evidence to support one or the other. In such cases our recommendation can only be that practitioners must make up their own minds using other means—in other words, for junior and non-specialist staff, local advice must be followed.

It is of great interest to me that the first comments on the BETs are about negative reports. There are of course two reasons why a

report can be negative: first the search strategy may be flawed and secondly no research may have been published. In the latter case this may be because the research question is novel or because the question being asked has been considered not worth answering.

We go to great lengths to ensure that the search strategies used are highly sensitive[4] (particularly in the case of negative BETs), but recognise the limitations of Medline. We believe that by only seeking to answer questions that arise in clinical practice we avoid questions that are not worth answering. Thus negative BETs should identify novel research questions or highlight areas of clinical uncertainty.

It is therefore disappointing to see these negative BETs labelled as unhelpful, potentially misleading, or as a cause for misunderstanding. Rather they offer an opportunity for re-examining our ideas about the treatment of these conditions, and allow us to decide whether well designed studies that really answer the questions posed are needed.

1 Carley S, Mackway-Jones K (Mackway-Jones K, ed). Collar and cuff or sling after fracture of the clavicle. *J Accid Emerg Med* 1999;16:140.
2 Herren K, Carley S (Mackway-Jones K, ed). Support for uncomplicated shaft of humerus fractures. *J Accid Emerg Med* 1999;16:141.
3 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.
4 Mackway-Jones K, Carley SD, Morton RJ, *et al.* The best evidence topic report: a modified CAT for summarising the best evidence in emergency medicine. *J Accid Emerg Med* 1998;15:222–6.

Management of minor head injuries by non-specialists

EDITOR,—The management of patients with a minor head injury (MHI)—that is a Glasgow coma scale score of 13–15,[1] once the decision has been made to admit them, is relatively simple and straightforward. The value of having neurosurgical specialist input could be looked upon as a luxury. In Nottingham there is a co-located accident and emergency (A&E) department with a regional neurosurgical unit. It is often the case that the A&E beds for observation become full and the local arrangement is for the regional neurosurgical unit to admit the patient under their care. The use of this resource for this condition has been questioned and a retrospective review of patients with a MHI admitted to this hospital was undertaken to determine the actual involvement of neurosurgery in the management of these cases in a typical teaching hospital.

For the calendar year of 1996, 618 adults (>16 years of age) were admitted with a diagnosis of MHI for observation, of whom 89 (14.4%) were referred to the regional neurosurgical unit (M:F = 63:26; 70.8%:29.2%). Thirty seven (42%) had other injuries, some of which would have required admission in any case, for example maxillofacial or spinal fracture in eight (9%), their MHI being truly minor.

The A&E referral was made because of no A&E beds in 47 (53%), was not stated at all on the admission card in 22 (25%), was for "social reasons" in four (4%), and in two (2%) was because they had been under a neurosurgeon some years previously for totally unrelated conditions. Only two of 24 (8%) patients who had a computed tomography during their admission had anything abnormal detected, neither of whom needed any intervention beyond simple observation.

The same survey carried out in the same hospital in the year 1992 revealed, using a randomly acquired sample of 90 patients with MHI, that eight (9%) were referred to the regional neurosurgical unit, none of whom needed any active intervention.

One of the authors (NB) carried out a similar review of patients admitted under general surgeons with MHI for the year 1991 in a different large general hospital with a co-located A&E department (at that time a trial trauma centre) and subregional neurosurgical unit. Of 53 patients admitted with MHI only four (7.5%) required a neurosurgical opinion and none required active intervention.

These three temporally separate studies in two different, but similar, hospitals found a total of 761 patients admitted with MHI, none of whom required neurosurgery. It is our contention that no patients with MHI need be admitted under the care of neurosurgeons in this country and that patients who need specialist neurosurgical input can be identified by neurological observations in a non-specialist setting and referred for advice or action accordingly.

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1 Miller JD. Minor, moderate and severe head injury. *Neurosurg Rev* 1986;9:135–9.

Visual assessment of blood loss by accident and emergency staff

EDITOR,—Birkinshaw *et al* have recently demonstrated that in reconstructed scenarios using manikins, 80% of estimates of blood loss by paramedics and technicians were underestimates, and for a blood loss of 3 litres the mean underestimate was 60%.[1] It is also important that staff in the accident and emergency (A&E) department can assess blood loss that is continuing within the department and also assess loss in clothing as it is removed, as is stressed in Advanced Trauma Life Support courses.[2]

We undertook a study whereby a measured volume (450 ml) of expired human whole blood was spilt over some clothing on a non-absorbent surface. After five minutes this scene was photographed. The photograph was shown to staff of the A&E department and they were asked to estimate the volume of blood shown in the photograph.

Forty A&E nurses and 18 senior house officers (SHOs) were surveyed. Their estimates of blood loss are shown in table 1.

This demonstrates that staff in A&E show a wide variation in the accuracy of their estimations of blood loss and it is not reliable for clinical decision making. In contrast to the pre-hospital study, A&E staff appear to overestimate blood loss. None of the staff had ever been shown pictures of measured blood loss as part of their training. There is a need to train A&E staff in the assessment of external blood loss.

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1 Birkinshaw R, Zahir M, Ryan B. Visual assessment of blood loss at the accident scene. *Pre-hospital Immediate Care* 1998;2:197–8.
2 American College of Surgeons. *Advanced trauma life support for doctors.* 6th Ed. Chicago: ACS, 1997.

Transtracheal jet ventilation and the completely obstructed airway: incorporating an active expiratory phase

EDITOR,—Transtracheal jet ventilation is an important technique in emergency airway management. During an audit of equipment available for emergency airway management we had occasion to test various devices for transtracheal jet ventilation on a model trachea and lung (BOC Lung Ventilator Performance Analyser, compliance 50 ml/cm H_2O) with an interposed Wright respirometer to measure minute ventilation. Using a 14 gauge cannula and Sander's injector connected to a 400 kPa oxygen outlet in a model where the "laryngeal" end of the "trachea" was completely obstructed, further ventilation following the first insufflation was clearly not possible without hyperinflation of the model lung.

In this situation where expiration via the natural airway is not possible, it is a commonly believed myth that insertion of another 14 gauge cannula will allow the lungs to deflate between insufflations. In our model, when this was performed, a minute ventilation of 2.5 l/min was achieved. This is clearly insufficient for adequate ventilation for any considerable length of time. However, when the expiratory cannula was connected to standard wall suction set at "high" (80 kPa), a minute ventilation of 10 l/min was consistently achieved. A similar result was obtained using only one cannula connected to the Sander's injector and suction via a three way tap alternating between the two for inspiration and expiration.

This technique has not been tried in clinical practice and it is possible that the expiratory phase could become obstructed by tracheal mucosa, blood, or mucus. However, in the situation of a completely obstructed airway where a satisfactory needle cricothyroidotomy for transtracheal jet ventilation has been performed incorporation of an active expiratory phase may allow a clinically useful minute ventilation and would remove to some degree the time pressure before a more satisfactory definitive airway (for example surgical cricothyroidotomy) is achieved.

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Table 1 A&E staff's estimate of volume of a measured 450 ml blood loss

	No surveyed	*Mean*	*Maximum*	*Minimum*	*1st quartile*	*3rd quartile*
Nurse	40	577.6	3000	50	200	681
SHO	18	633.9	2500	30	250	575