A S GOLDIE
Intensive Care Unit, Yorkhill Hospital, Glasgow

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Traumatic pericardial tamponade

EDITOR,—We agree with Crawford *et al*[1] that it is difficult to make an early diagnosis of cardiac tamponade and even more difficult to diagnose penetrating cardiac injury in the haemodynamically stable patient without tamponade. Once tamponade has developed immediate intervention is critical. The role of rapid ultrasound and cross sectional echocardiography needs further clarification in these situations.

In several American trauma centres ultrasound examinations looking for haemopericardium and the more informative cross sectional echocardiography have been found to be very useful for the early diagnosis of penetrating cardiac injuries in haemodynamically stable patients, provided that are immediately available in the resuscitation room and performed and interpreted by trained technicians, cardiologists, trauma surgeons, or emergency physicians. In a study by Rozycki *et al* of 247 patients who had ultrasound carried out by trauma surgeons, the sensitivity, specificity, and accuracy was 100%.[2] Similarly, in a report by Ma *et al* of 245 patients who had ultrasound carried out by emergency physicians, the sensitivity, specificity, and accuracy were 100%, 99%, and 99% respectively.[3]

Freshman and his colleagues[4] did not show false negatives in a cross sectional echocardiographic examination of 32 patients in whom no pericardial effusion was found, contrary to the statement by Crawford *et al*.[1] However, a recent prospective study of 105 patients by Meyer *et al* showed that false negatives were a problem only in patients with a haemothorax, as cross sectional echocardiography missed four significant injuries. Otherwise the sensitivity, specificity, and accuracy of this investigation in those without haemothorax is at least as high as that of subxiphoid pericardiotomy (100%, 89%, and 90% respectively).[5]

The paper highlights the difficulties we face in the management of patients with traumatic haemopericardium in hospitals without cardiothoracic services on site. The matter is further complicated where there is no reliable 24 hour ultrasound service. In Glasgow, two haemodynamically stable patients decompensated rapidly, one requiring an emergency thoracotomy in the ward and the other in the resuscitation room. Both survived, but the outcome may have been different in other units. We suggest that another lesson to be learned from their experiences is to consider the option of rapid ultrasound or cross sectional echocardiography as early as possible when cardiac injury is suspected.

P E CHIQUITO
C L MUWANGA
R K BANERJEE
M JONES
D R PARKINS
Accident and Emergency Department, Sunderland General Hospital, Sunderland, Tyne and Wear

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SHOs' interpretation of *x* rays

EDITOR,—The article by McLauchlan *et al* on *x* ray interpretation by A&E SHOs[1] is both unscientific and unfair on our junior colleagues.

Essentially the authors have constructed an *x* ray quiz containing abnormalities that are both rare and often missed. So difficult were these films that 20% could not be identified by senior clinicians. The films were then shown, without any clinical information, to SHOs, many of whom had worked in A&E for just three weeks. This scenario is so far from reality as to render the results meaningless.

We all agree that a consultant based A&E service would improve standards but until that unlikely event occurs our junior staff deserve our support and not pejorative articles such as this. Of further concern is that this paper is likely to be quoted by those hostile to our specialty.

A fairer assessment of this issue is provided by an ongoing "missed fracture" audit in my department, which has shown that A&E SHOs miss one significant fracture for every 650 new attendances. A few of our more capable SHOs miss no significant abnormalities during their six months, and this variability in accuracy is worthy of further study.

A M LEAMAN
Princess Royal Hospital NHS Trust, Telford, Shropshire TF6 6TF

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The author replies

I agree with Mr Alan Leaman up to a point, in that there was an element of unreality in the quiz, but I do not think it was pejorative or derogatory to junior staff but rather encouraged further support for them.

Mr Leaman is correct in that the *x* rays were uncommon and sometimes difficult to diagnose (and not scoring 100% myself I strongly agree!) but they were all significant in that correct diagnosis would lead to important changes in the patient's management. As we discussed in the paper, detailed clinical information was not provided and this reduced the realism for junior doctors, although less so for the radiologists. The readers will have to judge for themselves whether they feel this was unscientific.

Although 20% of the abnormalities were not identified by senior clinicians, there was variation and for some films for which the senior doctors scored 100% correct, the juniors still scored poorly—for example, only 12% correctly identified perilunar dislocation, 34% elbow effusion, and 46% comminuted calcaneal fracture. These significant injuries are difficult to diagnose and many of us in A&E suspect that they are therefore likely to be missed by junior doctors working on their own. The idea of the paper was to document this more accurately and I think it does. At the same time we hoped it would act as further argument for providing juniors with greater support and training (as well as improved risk management) rather than being pejorative. I feel that analysing our errors and devising ways to overcome these is more important than fears of derisory comments from "those hostile to our specialty."

Mr Leaman mentions "missed fracture" audits, and I agree it is important to review these for feedback. However, statistically this is not very meaningful as any percentage error is bound to be small since most of the *x* rays are normal anyway, and the doctor's *x* ray threshold is an important variable. It is more accurate to look at the percentage of *abnormal* *x* rays that are missed. In our study, part of the point was that many of the important abnormalities were uncommon and SHOs on their own may only see one or two examples of each in their six months.

I certainly agree with Mr Leaman that our SHOs do a fine job but this paper emphasises that they need support and other systems to reduce the error rate.

CHRIS A J McLAUCHLAN
Royal Devon and Exeter Hospital, Exeter

Curriculum based teaching

EDITOR,—We were interested by the article by Davies *et al* on their experience of curriculum based teaching.[1] We too use a curriculum based programme. It is organised by a committee of four (two consultants and two trainees) and all of its members have accredited teaching skills, for example advanced life support instructor, City and Guilds teacher's certificate 7307. Consultants also contribute to the programme on the grounds that if you wish to benefit from the meetings you should be prepared to contribute to them. Two topics are covered in each afternoon meeting, with time built in for discussion. Although we do not attempt to rank our meetings we ask participants to evaluate the presentations.

The speakers are either consultants who present a topic related to their area of expertise and interest, or trainees who are required to extend their knowledge base by addressing an allocated topic from the FFAEM curriculum, but avoiding areas where they are likely to have a large knowledge base. The trainees are given six months' notice, allowing comprehensive research on their topic.

As regards content, all presentations have to be referenced from the most up to date sources and to be of the standard of Rosen *et al* and the *Oxford Textbook of Medicine*. It is also a requirement that the presentation should make clear any audit or resource implications.

Throughout the course there is standardisation of format: all presentations to be on Microsoft Powerpoint and be accompanied by a document on Microsoft Word or WordPerfect. Participants are also advised on font type, point size, and the use of colours.

At the end of the each meeting, which is informal and allows for constructive debate, the speaker receives a summary of peer group evaluations (trainees only). The Word and Powerpoint files are copied from the presenter's

disk to disks which are held by all consultants and trainees, and to a central computerised database thus building up a bank or textdisk (cf textbook) of presentations. Although the prescribed format may appear restrictive, it is itself evidence based[2] and it contributes to consistency and, in our experience, quality. Of course, the use of other additional teaching aids, for example flip charts, is not excluded. Trainees are obliged to attend except when on holiday or study leave. Audit of this has indicated 100% compliance. The programme has proved popular and has attracted the participation of two hospitals outside the region and of several non-career grade staff.

M F NICOL
K E JONES
M CAMERON
J KENDALL
Accident and Emergency Department, Musgrove Park Hospital, Taunton, Somerset TA1 5DA

1 Davies F, Geary U, Soulsby T, Good A. How we did it: the development of a specialist registrar training programme by the Mersey Accident and Emergency Trainees' Association. J Accid Emerg Med 1997;14:321-3.
2 *How to do it*, vols 1-3. London: BMJ Publishing Group.

Developments in radiology

EDITOR,—I read with interest the summary of current developments in radiology by Dr D Lloyd.[1] Our A&E department has been using digital radiology (Kodak/Laserlines) since January 1996. At the time we were provided with state of the art PCs for viewing the images, but they were not sufficiently powerful and viewing a series of images could be slow. Each image can be 10 Mb in size! In view of the speed penalty and the lack of provision of an archiving facility by Kodak, we have been using films with the facility of viewing the image on screen when necessary. So far the advantages are:

(1) Speeding up of the *x* ray reporting system (radiologists can report from the digital image and don't have to wait for the *x* ray films).
(2) The *x* ray image can be left on the hard disk on the A&E viewing stations for several days (if the hard disk is large enough). Therefore *x* ray images are easily available if the patient returns, or if a wrong *x* ray diagnosis is made they can be shown to junior staff.
(3) Compilation of a library of teaching *x* ray images in TIFF format. These are captured using the clipboard facility on Windows NT and are usually between 500 K and 1 Mb in size.
(4) Viewing of *x* ray films digitised at a minor injury unit sent down an ISDN line or hospital network (to be implemented March 1998).

On an optimistic note, the technology appears to have progressed sufficiently to make the system workable in A&E with no speed penalty. However the *minimum* specification is a Pentium 2 MMX 233 MHz, 128 RAM, 4 Gb wide SCSI hard drive, fast video card with 4 RAM, and 17 inch monitor. As an ideal, an A&E department should have as many viewing stations as they have doctors on duty.

The system however will *not* become cost-effective until Kodak provide an archiving facility, preferably using DVD (increased storage medium) CD ROM technology. Until then *x* ray films will have to be produced in addition to the digital images.

RAY MCGLONE
STUART DURHAM
Royal Lancaster Infirmary, Ashton Rd, Lancaster LA1 4RP;
email: Ray.McGlone@LAHT.NWEST.NHS.UK

1 Lloyd D. The value of current developments in radiology to the accident and emergency department - a pictorial review. J Accid Emerg Med 1997;14:381-6.

BOOK REVIEW

Advanced Paediatric Life Support: The Practical Approach, 2nd ed. By the Advanced Life Support Group. (Pp 306; £22.95.) London: BMJ Publishing Group, 1997. ISBN 0 7279 1069 8.

It is three years since the first edition was published and it has obviously been exceptionally successful from the fact that it has had three reprints before the second edition was published.

I think it is particularly impressive that the Advanced Life Support Group allows you to buy the APLS manual without having to attend the course. I am sure that this practice should be more widespread. Another commendable activity of the ALS Group is the fact that they invite all APLS instructors and providers for a "constructive critique" of the first edition.

There is no doubt that the working group have made significant changes to the first edition. Most notably they have tried to encapsulate the structured approach throughout the manual.

Included in the second edition are sections on diabetic ketoacidosis, the management of pain relief in children, and the structured approach to the seriously ill child. Another new section is on paediatric radiology which encapsulates the ABCS approach to interpretation of cervical spine, chest, and pelvic *x* rays. The only deficiency is the lack of radiographs or line diagrams.

The working party has attempted to revise some of the algorithms or incorporate new ones, in line with national recommendations. This I believe is essential for consistency in respect of treatment algorithms. There is an increasing move towards evidence based medicine and I would prefer to see all the APLS protocols nationally recommended.

The section on the management of poisoning has also been altered to follow a structured approach. Some of this section is not entirely in keeping with the recommendations of the National Poisons Information Centres. There is very little mention of alcohol, carbon monoxide/smoke inhalation, solvents, and benzodiazepine overdose.

I would like to see more detail on meningococcal disease and triage (to include "Baby Check"), and more emphasis on the team approach. I also felt it was a pity that the paediatric resuscitation chart was not included.

The practical procedures section is very useful, and includes femoral venous access. A little more detail would be helpful: for example, intraosseous infusion should include details of contraindications and complications of this procedure.

Overall the *APLS Manual* will certainly achieve its aim to improve the emergency care of children.

RUPERT J EVANS
Cardiff