Junior doctors' ability to interpret lateral soft tissue neck X-rays: is there a training issue?

In light of the introduction of the European Working Time Directive and Modernising Medical Careers initiative, this article reports the results of a study to see whether junior doctors possess adequate skills to correctly interpret lateral soft tissue neck X-rays and if they receive adequate training.

Over recent years both undergraduate and postgraduate training has changed to comply with the implementation of the European Working Time Directive. Modernising Medical Careers was introduced with the aim of shortening training times (Devey, 2005). However, high standards of training and trainees have to be maintained.

Implementation of the European Working Time Directive has increased the incidence of cross cover between specialities by junior doctors. Within the authors' department, ear, nose and throat and plastic surgery senior house officers and foundation year doctors provide out-of-hours cross cover. It is important to ensure that junior doctors possess the necessary skills required to deal with patients presenting to them.

Patients presenting with a 'foreign body' in the aerodigestive tract can present to the accident and emergency department as well as directly to the otolaryngologist. In the accident and emergency department they are often seen by junior medical staff and either discharged or referred to the otolaryngologist for a further opinion. A lateral soft tissue neck X-ray is often obtained as part of the assessment of these patients and junior doctors should therefore have the necessary skills to interpret these X-rays. A foreign body that is missed can often lead to significant morbidity and mortality.

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A small study was undertaken to assess junior doctors' ability to correctly interpret lateral soft tissue neck X-rays, and to identify if further training is required.

Method

Junior doctors from the departments of accident and emergency, otolaryngology and plastic surgery (those that cross cover with otolaryngology) were invited to take part in the study.

Verbal consent was sought and each subject filled out an anonymous questionnaire. Subjects were presented with a normal lateral soft tissue neck radiograph and asked to stick on pre-labelled stickers which corresponded to the appropriate anatomical landmark on the radiograph (*Figure 1*). They were then presented with five further radiographs (*Figures 2–6*) and asked to write down whether they were normal or abnormal. If abnormal they were asked to comment on the abnormalities (there were a total of 13 on the radiographs relating to the aerodigestive tract). There were no time constraints on how long each subject was allowed to view the radiographs. The questionnaire also asked each participant to mark on a visual analogue score how confident he/she felt in interpreting lateral soft tissue

Figure 1. Normal radiograph with the anatomical landmarks that the participants had to label.

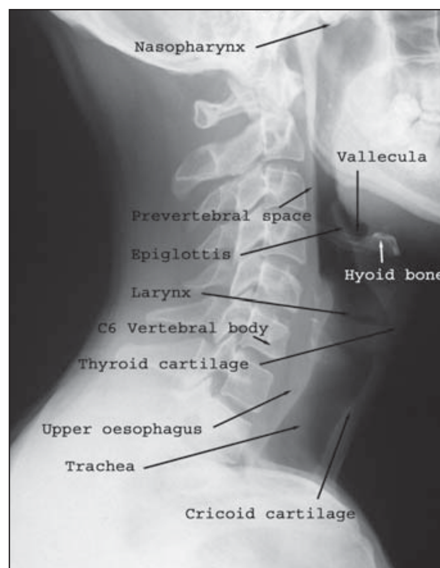


Figure 2. Radiograph showing extensive surgical emphysema (arrowheads) and a foreign body (fish) in the pharynx (arrow) and loss of cervical lordosis.

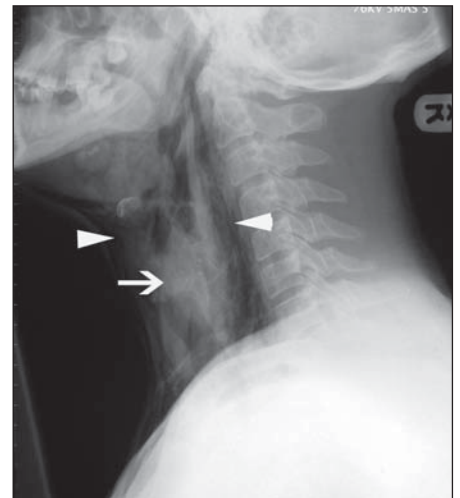
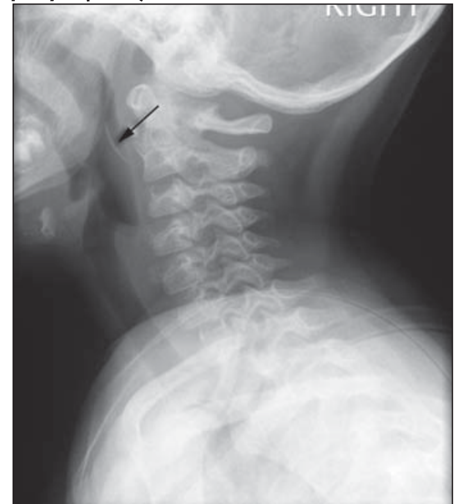


Figure 3. Radiograph showing a fishbone in the pharynx (arrow).



neck X-rays. The results were analysed using non-parametric tests.

Results

A total of 31 junior doctors took part in the study: 24 were working in the accident and emergency department and the rest were either working in ear, nose and throat, or plastic surgery with ear, nose and throat on-call cross cover. Of respondents, 24 doctors were senior house officers, six were foundation year 2 doctors and there was one house officer. The amount of accident and emergency experience varied from 0 to 52 weeks with an average of 13 weeks. Only seven participants had any ear, nose and throat experience and one participant had attended a formal radiology course. A total of 11 participants had received training in interpreting lateral soft tissue neck radiographs and this included ear, nose and throat, radiology courses or departmental teaching. The time spent training varied from 30 minutes–6 hours.

The mean visual analogue score (out of 100 mm) for junior doctors' confidence in interpreting lateral soft tissue neck X-rays was 26 mm with a range of 0–80 mm. A score of 100 mm meant that they were fully confident. Those who had received training felt more confident in their ability compared to those without any training (Mann–Whitney test, $P<0.002$).

There were 11 anatomical landmarks that participants were asked to label on the radiograph (*Figure 1*). The mean score was seven correctly labelled landmarks, with a range of 0–11 and there was no significant difference between those who had received training and those who had not.

Abnormal radiographs were correctly identified 80% of the time, but on average participants could identify fewer than two out of 13 abnormalities relating to the aerodigestive tract. There was no significant difference between those who had received training and those who had not (*Table 1*). Most subjects identified extensive surgical emphysema but failed to identify foreign bodies, soft tissue oedema and loss of cervical lordosis. The total number of false negative and false positive entries in the five radiographs was 69 and 36 respectively.

Figure 4. Radiograph demonstrating air in the upper oesophagus (arrow) as a result of an impacted foreign body and air in the upper oesophagus as well as cervical osteophytes.

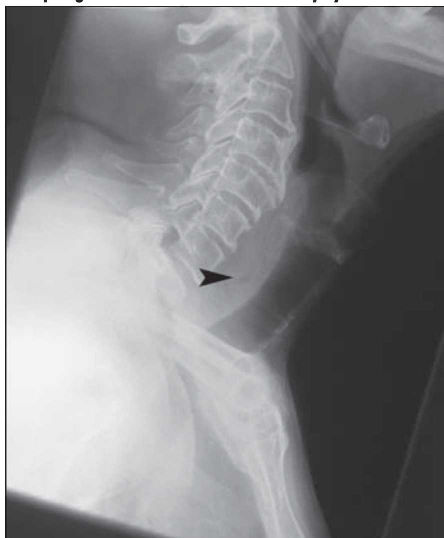


Figure 5. Radiograph showing an impacted foreign body in the upper oesophagus (arrow) and loss of cervical lordosis.

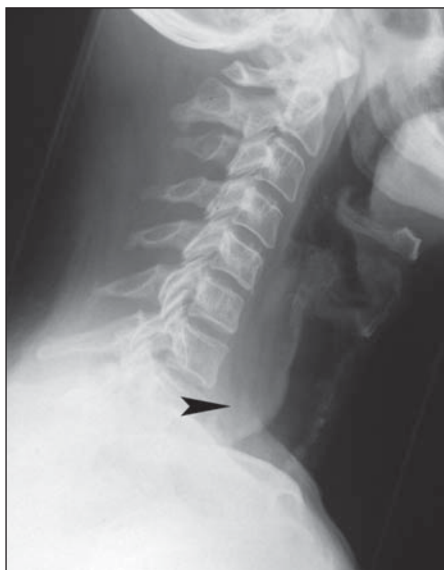
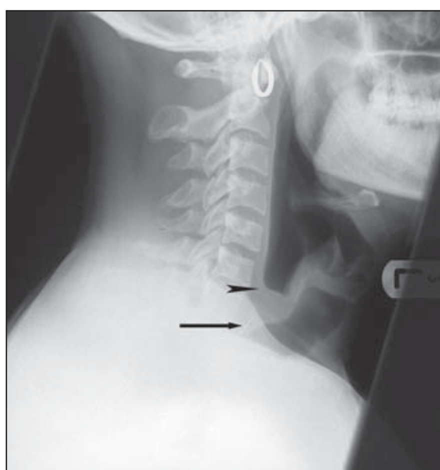


Figure 6. Radiograph showing an impacted radio-opaque bone impacted in the upper oesophagus (arrow) with an associated fluid level (arrowhead) and loss of cervical lordosis.



Discussion

Changes as a result of the implementation of the European Working Time Directive and Modernising Medical Careers will no doubt lead to new working and training arrangements. Otolaryngology is often considered a postgraduate specialty and thus is only taught in two thirds of the medical schools in the UK (Sharma et al, 2006). Sharma et al (2006), in their survey of accident and emergency senior house officers, reported that 90% found undergraduate ear, nose and throat training to be beneficial to their work while 75% felt they had not received enough undergraduate training and 45% felt they had not received any postgraduate ear, nose and throat training while working in accident and emergency.

Doshi and Carrie (2006) reported that only 54% of final year medical students at Newcastle University Medical School had a formal ear, nose and throat attachment, and this attachment lasted, on average, only 7.5 days. Mace and Narula (2004) reported that 42% of students did not have a formal assessment of their clinical skills or knowledge at the end of ear, nose and throat attachments. Clamp et al (2007) also reported that three-quarters of the GPs that they had surveyed felt they had inadequate undergraduate ear, nose and throat training. In the current study this is reflected in the low visual analogue score when asking about the confidence level of junior doctors' self-assessed ability to interpret lateral soft tissue X-rays.

Table 1. Radiology training *vs* correct scores

Radiology training	No. of correct anatomical landmarks out of 11 (average)	No. of correct abnormal X-rays out of five (average)	No. of abnormal findings out of 13 (average)
Yes	8.1	3.7	1.6
No	6.7	4.1	1.91

In order to be able to interpret lateral soft tissue radiographs of the neck prior knowledge of the normal anatomy is needed. Without sufficient knowledge patients cannot be managed competently. Patients with evidence of aerodigestive tract foreign bodies can present in a variety of ways and some of the radiological features can be subtle. These radiographs are often not formally reported by radiologists, so it is important for junior doctors to be able to interpret them correctly.

On average only seven out of 11 anatomical landmarks were correctly identified on the lateral soft tissue neck X-ray and greater experience and confidence level did not necessarily correlate with better scores. Although abnormal radiographs were correctly identified 80% of the time it is disappointing that on average only two out of 13 abnormalities were correctly identified, which may indicate the use of guesswork rather than knowledge. There were no significant differences between those with ear, nose and throat and those with accident and emergency experience.

Conclusions

There is a lack of confidence as well as a lack of knowledge among trainees in interpreting lateral soft tissue neck radiographs. This study cannot conclude whether this is as a result of recent changes in training or European Working Time Directive. In the authors' view this needs to be addressed at both undergraduate and postgraduate teaching. Otolaryngology needs to be an integral part of the undergraduate curriculum with clear aims and objectives. Assessments at the end of clinical attachment should also be encouraged. At a postgraduate level adequate training opportunities must be made available and trainees encouraged to broaden their knowledge. BJHM

KEY POINTS

- Otolaryngology is often considered a postgraduate specialty and as a result is only taught in two thirds of the medical schools in the UK.
- In this study and others, the majority of junior doctors felt they had not received enough undergraduate training in otolaryngology.
- There is a lack of confidence as well as lack of knowledge among trainees in interpreting lateral soft tissue neck radiographs.
- This needs to be addressed at both undergraduate and postgraduate levels.

Conflict of interest: none.

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