A study of the performance of cricothyroidotomy on cadavers using the Minitrach II

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SUMMARY

Cricothyroidotomy was attempted on 15 cadavers. Five out of 15 doctors failed to cannulate the trachea. The high failure rate and incidence of complications are discussed. All doctors found the experience beneficial.

INTRODUCTION

Accident and emergency staff who may be required to perform an emergency cricothyroidotomy are likely to be junior with no previous experience of it. Doctors within an accident and emergency department were given the opportunity to attempt cricothyroidotomy upon cadavers using the Minitrach II system (Portex), consisting of a guarded scalpel together with a plastic introducer and flanged 4mm tracheotomy tube.

METHOD

Doctors were asked about their knowledge of cricothyroidotomy and if they did not know the procedure, they were instructed as in the manufacturer's literature. They were told that the deceased required an emergency cricothyroidotomy and to attempt the procedure. The post-mortem examination, which was to be carried out for other reasons then took place and the position of the tube was ascertained.

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RESULTS

Twelve out of the 15 doctors recognized the Minitrach II equipment and six of these said they knew how to perform a cricothyroidotomy. Three doctors had seen a cricothyroidotomy performed electively previously and one had performed it as an emergency procedure. All doctors on making an attempt at cricothyroidotomy extended or attempted to extend the neck and made a midline incision. The mean time for the performance of the procedure was 63 s (range 25–150 s).

Five tubes were found in an extratracheal position. Of these two were paratracheal, one had been inserted through the posterior wall of the trachea and one had been inserted supraglottically and was placed within the oesophagus. Of the 10 tubes placed within the trachea five had been inserted through the cricothyroid membrane, four directly through the trachea and one had introduced the tube supraglottically through a vocal cord in to the trachea. No major vessel nor the oesophagus was penetrated but the first tracheal ring had been cut twice and the cricoid completely divided once. The epiglottis had been pierced on one occasion and the tracheotomy tube had been introduced behind the thyroid isthmus on two occasions.

All found the procedure beneficial and 13 out of the 15 doctors felt more confident than previously about subsequent performance of cricothyroidotomy.

DISCUSSION

The fact that five out of 15 failed to cannulate the trachea and that a complication rate of 39% for cricothyroidotomy has been recorded by others (McGill *et al.*, 1982) suggests that accident and emergency staff should be given the opportunity to practise this potentially life-saving procedure as part of their routine training. The initial difficulty was trying to maintain alignment between the incisions through skin and cricothyroid membrane. Failure to do so led to the introducer sliding off the trachea in to adjacent tissue planes. One strategy suggested to avoid this difficulty is initially to insert a needle through the cricothyroid membrane having located it by 'walking' it down the cricothyroid cartilage and using it as a guide for the scalpel incision (Lewis *et al.*, 1986). Secondly, many found the palpation of the body landmarks difficult in the cadaver because of altered tissue texture. There was also the disadvantage of not being able to assess the position of the tube by ventilating the patients. However, these disadvantages must be weighed against the advantages of absent patient movement or bleeding. All the doctors found the exercise useful and it is likely to be more life-like than the expensive cricothyroidotomy simulators available.

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