Intens. Care Med. 6, 145 – 146 (1980)

Intensive Care Medicine

Editorial

Fibreoptic Bronchoscopy in the Intensive Care Unit

Duncan M. Geddes

Brompton and London Chest Hospitals

Fibreoptic Bronchoscopy (FB) has now largely replaced rigid bronchoscopy in the diagnosis of lung disease. The technique is more acceptable to the patient, allows a more complete examination of the bronchial tree and is ideal for a variety of other diagnostic procedures such as transbronchial biopsy and bronchial lavage [4, 7]. In an intensive care unit bronchoscopy is more often needed for treatment than diagnosis and although no formal comparison of the rigid and flexible instruments has been carried out FB is now well established as the preferred technique since it is effective, safe and can be done during artificial ventilation.

Many different centres have now reported their experience with FB in the ICU [1, 5, 6] and the subject has been comprehensively reviewed [3]. A report from New York [1] details 446 bronchoscopies performed on 309 patients who were either critically ill or developed respiratory complications after major surgery. The commonest indication (68%) was for the removal of retained secretions either with a chest x-ray abnormality or when conventional suction had failed. 26% of the bronchoscopies were performed because of suspected aspiration and the remainder for a variety of indications such as artificial airway problems or haemoptysis. The results were good, in half the procedures retained secretions were found and in every case these were removed with improvement in arterial oxygenation. In 28 of 30 cases of atelectasis the x-ray became normal. The two failures were due to a bronchial neoplasm. When aspiration was suspected about half had evidence of a chemical bronchitis and 23% had food particles etc. removed by suction; three foreign bodies were removed by biopsy forceps. Complications of the procedure are difficult to assess in critically ill patients but are probably negligable. Seven patients had pre-existing cardiac arrhythmias which might have been aggravated by the procedure; three cardiorespiratory arrests occurred but in two of the patients the bronchoscopy was being done because of a previous episode of arrest. One patient in cardiogenic shock died an hour after the procedure but the bronchoscopy could not be blamed. This experience is similar to other reports which all show that fibreoptic bronchoscopy is an efficient and safe way of removing secretions. A prospective controlled trial has demonstrated that FB is superior to blind suction in clearing secretions in mechanically ventilated patients [8]. This is not surprising since the instrument is in effect a 'suction catheter with an eye'. Nevertheless in practice retained secretions can usually be removed by blind suction with manual hyperinflation and percussion and FB should be reserved for relative rare cases when these simpler measures are ineffective or when adequate physiotherapy cannot be given because of multiple injuries etc. FB is costly in terms of staff and equipment and should not be allowed to replace suction and physiotherapy simply because it is an interesting and complex new procedure.

As a diagnostic tool FB has an unchallengable role. Apart from the investigation of bleeding and possible obstruction of the major airways FB can be used to inspect the trachea and larynx for damage from artificial airways. One American centre advocates routine inspection of the trachea and larynx before closure of a tracheostomy [6]. Similarly FB can assist the positioning and introduction of artificial airways in patients where there are unusual difficulties. For obtaining specimens from the lower respiratory tract for bacteriology FB is unrivalled. Brushing and suction with or without lavage allows safe collection from the desired site. These techniques are superior to blind suction and may be combined with transbronchial biopsy in selected patients. Transbronchial biopsy provides small samples of peripheral

0342-4642/80/0006/0145/$01.00

lung tissue for culture and histology. This can be particularly helpful in the diagnosis of unexplained pulmonary shadowing due to opportunistic infection [2], and may give helpful information in the adult respiratory distress syndrome. The samples are very small and pathological interpretation may be difficult, nevertheless transbronchial biopsy is much simpler than and should always be considered before open lung biopsy. Transbronchial biopsy carries a slight risk of pneumothorax or bleeding which has occasionally been fatal. It should ideally be done under screening and only by someone expert in the technique. It should not be done as an occasional procedure by an inexperienced bronchoscopist.

There are a few special technical difficulties encountered during FB in the I.C.U. The bronchoscope should have a large suction channel to assist clearance of thick secretions. The Olympus BF 1T or Machida 5BS-6TL are ideal with a 2.6 mm channel while the Machida 5BS-6TL-W has an additional channel so that lavage and suction can be done at the same time. Paediatric bronchoscopes do not have a suction channel and are therefore unsuitable. The instruments can be passed easily down endotracheal tubes internal diameter 8.5 mm or greater. Smaller tubes and especially nasotracheal tubes cannot be used in this way and the bronchoscope must then be passed alongside the tube while the cuff is temporarily deflated. Reinflation of the cuff with the instrument in place usually gives an adequate seal. A number of special adaptors have been designed to allow passage of the bronchoscope via an endotracheal tube without causing an air leak. A Portex disposable swivel adaptor with a fibreoptic bronchoscopy cap is available but a small hole or two right angle slits cut in the rubber suction cap of a T adaptor is normally adequate. PEEP can be maintained without difficulty but occasionally an increase in tidal volume or slowing of inspiratory flow to lower peak pressure is necessary to minimise air leak. A volume limited ventilator is preferable and administration of 100% oxygen during the procedure is a sensible precaution.

The operator must be familiar with bronchial anatomy and have reasonable bronchoscopic experience since it is surprisingly easy to get lost within the bronchial tree and the presence of copious secretions impair the view. A bronchoscopist ideally should carry out FB but in many centres anaesthetists have now learnt the technique. An inexperienced operator will have difficulty at first and so the procedure will be prolonged with an increase in morbidity and perhaps mortality. The I.C.U. is not a suitable place to learn bronchoscopy.

FB has a definite therapeutic and diagnostic role in I.C.U. and in experienced hands is safe and valuable. At present it is probably underused and the technique should always be available within the hospital. So long as it does not suffer from too much inexperienced enthusiasm FB should become a routine procedure in the management of the critically ill patient.

References

1. Barret CR (1978) Flexible fibreoptic bronchoscopy in the critically ill patient. Chest 73:5 (Suppl) 746
2. Ellis JH (1976) Diagnosis of opportunistic infections using the flexible fibreoptic bronchoscope. Chest 73:5 (Suppl) 713
3. Feldman NT, Huber GL (1976) Fibreoptic bronchoscopy in the intensive care unit. Int Anaesthesiol Clin 14:31
4. Fibreoptic Bronchoscopy (1978) Chest 73:5 (Suppl)
5. Milledge JS (1976) Therapeutic fibreoptic bronchoscopy in intensive care. B Med J 4:1427
6. O'Donnell JE (1975) Fibreoptic endoscopy of the respiratory tract in the intensive care ward. Anaes Intens Care 3:139
7. Sackner MA (1975) Bronchofiberscopy. Am Rev Resp Dis 111:62
8. Wayand W (1979) Controlled clinical trial of blind versus aimed fibrebronchoscopic suction in mechanically ventilated patients. Anaesthetist 28:92

Dr. D. M. Geddes
Consultant Physician
The London Chest Hospital
Bonner Road
London E2 9JX
England