surgery and up to one year afterwards. We are currently investigating these patients again at five years from operation to report on the longer term outcome. Combined with the excellent survival data on patients with bypass grafts in various centres,^{18,19} our evidence supports the argument that resources allocated to this form of intervention are well spent. For this conclusion to be universal, however, every major centre should evaluate its own work. Continued monitoring of results is important in itself but particularly so when major changes in practice have occurred or are being contemplated. Extending the selection criteria to incorporate older patients and the advent of alternative forms of treatment, such as angioplasty, are just two examples particularly relevant to bypass surgery.

To assess fully the effects of treatment it is vital to take baseline measurements before intervention as well as at intervals afterwards. Preoperative variables and measurements that are found to be associated with the rate and extent of rehabilitation after operation might lead to changes in selection or management—for example, in timing of surgery—which would benefit individual patients and the health service in terms of the best possible use of resources allocated to coronary artery bypass surgery.

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Lesson of the Week

Life threatening laryngeal oedema after prolonged intubation for chickenpox pneumonia

O F Boyd, R M Grounds

Elective tracheostomy should be considered in patients ventilated for chickenpox pneumonia

Guidelines for timing tracheostomy in patients on ventilators remain vague.¹ Studies of this problem,^{2,3} and specifically the complications of endotracheal intubation,⁴ do not take into account the type of disease in either the results or recommendations. We report on three adults with chickenpox pneumonia, seen from December 1989 to May 1990, who required ventilatory support and in whom severe life threatening laryngeal oedema developed on extubation.

Case reports

Case 1—A 33 year old male smoker was admitted five days after the onset of symptoms of chickenpox and two days after chickenpox pneumonia had been diagnosed. He had extensive skin lesions but no mucosal lesions. Two days later he required ventilation and a high volume, low pressure, size 9.0 orotracheal tube (Portex) was inserted uneventfully. On the 17th day of ventilation his tube became obstructed. No new skin lesions had appeared for 10 days, but a chest radiograph still showed considerable bilateral shadowing. At reintubation visualisation of his larynx showed massive laryngeal oedema; intubation was prolonged owing to anatomical distortion, and he had a cardiac arrest. He failed to regain consciousness and died on the 35th day of ventilation of a pulmonary embolism.

Case 2—A 43 year old male smoker was admitted for ventilation for chickenpox pneumonia four days after the onset of symptoms. He had widespread skin lesions but no mucosal lesions. Intubation with a size 9.0, high volume, low pressure orotracheal tube (Portex) was uncomplicated. On the 14th day no new skin lesions had appeared for seven days and the shadowing in radiographs of the chest had started to clear. He had been breathing spontaneously for 24 hours and was extubated. Four hours later he had increasing stridor and required reintubation. Laryngeal visualisation showed oedematous folds from the laryngeal wall obscuring the whole supraglottic and glottic region. Intubation was prolonged, and he had a hypoxic cardiac arrest, from which he was resuscitated without neurological deficit. On the 18th day tracheostomy was performed, and the tube was removed on the 30th day. On the 31st day nasolaryngoscopy showed granulomas on the vocal cords but no oedema. The granulomas subsequently resolved.

Case 3—A 73 year old woman with chickenpox pneumonia was admitted two days after developing symptoms with extensive skin lesions but no mucosal lesions. Three days later she required ventilation; intubation with a size 8.0, high volume, low pressure orotracheal tube (Portex) was uncomplicated, and at laryngoscopy the larynx was normal. By the 20th day she fulfilled our usual criteria for extubation, but our

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previous experience prompted caution. On the 21st day she was transferred to theatre; under general anaesthesia direct laryngoscopy showed a severely oedematous larynx. A trial of extubation caused rapid arterial oxygen desaturation despite 100% oxygen. Her trachea was reintubated with the aid of a fine bore catheter that had been left in the trachea, and a tracheostomy was performed uneventfully. On the 26th day nasolaryngoscopy showed persistent but not severe laryngeal oedema, and on the 32nd day the tube was removed.

Discussion

Mild degrees of laryngeal oedema occur after endotracheal intubation in up to 5% of cases, but this is only rarely an indication for reintubation and has not been related to the underlying disease process.⁴ Our three cases of life threatening laryngeal oedema after ventilation for chickenpox pneumonia therefore seem to be unique and show a considerable additional risk associated with ventilation for this illness.

In these three cases we followed our routine practice of orotracheal intubation for 20-25 days before tracheostomy is considered unless there are specific indications. It seems unlikely therefore that either the length or technique of intubation or the care of the tube played a major part in causing the laryngeal oedema. Fourteen, 17, and 20 days of intubation are within the time ranges of studies in which reintubation for laryngeal disease was not required.^{2,3}

Chickenpox is more severe in adults than children, and pneumonia is more common in adults, with 16% having evidence of infection on chest radiography, although only one third of these have respiratory symptoms.⁵ Pneumonia may be more common⁶ and more severe in smokers, but only rarely is ventilation

required.⁷ The skin lesions of chickenpox are larger, denser, and more confluent in areas subjected to mechanical trauma.⁸ Despite the lack of mucosal lesions at initial intubation and treatment with acyclovir^{7,9} in our patients it seems likely that a combination of the disease and the mechanical effects of intubation probably caused the laryngeal oedema. This complication has probably not been found before owing to the tendency in the past to perform tracheostomy earlier. We now recommend elective tracheostomy several days before tracheal extubation is expected in patients with chickenpox pneumonia who have been ventilated for longer than 10 days. Tracheostomy should be performed at least seven days after the last skin lesions have appeared. Laryngoscopy should be performed before removal of the orotracheal tube. In patients who have been ventilated for less than 10 days direct laryngoscopy should be performed before extubation and a decision made then about the requirement for tracheostomy.

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ANY QUESTIONS

A 50 year old mentally subnormal, severely physically retarded patient lives with his agoraphobic, paranoid (but not certifiable) sister in a dilapidated, filthy cottage, which the public health authority refuses to condemn. His sister refuses to let him out of the house even for a bath or physiotherapy, rejecting all offers of help from every agency that regularly visits the house—health visitor, social worker, community psychiatric nurse, district nurse, and general practitioner. He is kept for most of the day in bed, despite being incontinent, and is emotionally and physically neglected. The social services cannot obtain a guardianship order under the Mental Health Act because, though he is mentally subnormal and needs to be in a place of care, he is not “abnormally aggressive or has seriously irresponsible behaviour.” How can the general practitioner legally help this patient?

I think that the man in question fulfils the criteria of section 47 of the National Assistance Act 1948, which gave the medical officer of health the authority to apply to a magistrate for the compulsory removal of a person who is “(a) suffering from grave chronic disease, namely . . . or, being aged, infirm or physically incapacitated, is living in insanitary conditions, and (b) unable to devote himself (herself), and is not receiving from other persons, proper care and attention.”

The important criteria are that he is infirm and severely physically retarded, clearly living in insanitary conditions, and unable to look after himself and not being properly looked after. The act enables the proper officer of the local authority to remove the person from his home to some suitable accommodation, which need not be a hospital; but it is important that the managers of that accommodation must consent to the patient being transferred there. Originally the act required application to be made

to a magistrate, with seven days’ notice being given to the patient, but it was amended in 1951 to enable the procedure to be carried out as an emergency, with applications being made direct to a magistrate by the proper officer and another registered medical practitioner. This enables compulsory removal to be carried out urgently without delay, and formal application to the court is required only if compulsory detention is necessary beyond three weeks and up to three months. Most instances of implementation of section 47 are done under this emergency procedure.

Surveys of the use of section 47 show that the typical patient is elderly, living alone, in poor physical health, and often suffering from a major psychiatric disturbance. Mortality in the early stages after use of the law is high, and the numbers returning permanently to their own homes are small.

The use of section 47 may occasionally enable the environmental health department and volunteers to clean up a house and organise support services to allow the person to return to his or her home. Personal experience, however, has shown that the circumstances precipitating the compulsory removal may recur but considerably later. For the patient described the use of section 47 would probably offer only a period of respite, but this could be used constructively to obtain a long term solution relying on voluntary agreements rather than the law.—PETER TIPLADY, director of public health medicine, Carlisle

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