ENDOBRONCHIAL ANAESTHESIA IN YOUNG CHILDREN

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SUMMARY

Selective intubation of a main bronchus during thoracotomy in three young children is described. Modified endotracheal tubes were used to intubate the left main bronchus in an infant with a right bronchopleural fistula and the right main bronchus in two children aged 3 years, one of whom had a foreign body in the left main bronchus, and the other a left empyema thoracis. In these cases the technique was simple and satisfactory.

During thoracotomy in adult patients bronchial intubation is used to control pulmonary ventilation in the presence of an open bronchus, to prevent spread of secretions and to aid surgical access. In a recent textbook of thoracic anaesthesia Wilton (1963) says that “in infants and small children, the air passages are so small that the use of blockers and endobronchial intubation is not possible”. In another chapter, however, Hillard and Thompson (1963) mention the use of a modified Magill blocker with a short cuff in the main bronchus of a child, and they also describe Machray endobronchial tubes ranging from 5 mm internal diameter. Bush (1963) has shown that catheters for suction may be introduced into either main bronchus as easily in an infant as in an adult.

Three cases are described:

CASE NO. 1. A baby girl aged 2 months and weighing 3.2 kg developed a right bronchopleural fistula as a complication of staphylococcal pneumonia. Despite underwater drainage, the air leak was so great as to cause acute respiratory failure and cardiac arrest. A size 0 Magill endotracheal tube was introduced during resuscitation. She was taken to the operating theatre for a thoracotomy. After an intravenous injection of tubocurarine 0.5 mg, a metal director the tip of which was slightly bent as shown in figure 1A was passed gently down the endotracheal tube until its tip was thought to be in the left main bronchus. The tube was gently advanced over this and the director was then removed. The air leak was controlled and selective inflation of the left lung confirmed by auscultation as well as at thoracotomy. After right pneumonectomy the patient progressed well at first but died three weeks later from infection in the remaining lung.

CASE NO. 2. A 3-year-old boy who had recurrent respiratory infections, was found to have an open safety pin in his left main bronchus (fig. 3). Endoscopic removal did not seem to be advisable and a thoracotomy was performed. A size 2 Magill endotracheal tube (fig. 1c) was cut so that the bevel was reversed and a hole was made for inflation of the right upper lobe (Gordon and Green, 1955). This was easily positioned in the right main bronchus to allow selective inflation of the right lung. The pin was removed through a wide bronchotomy (fig. 2). A larger tube would have been more satisfactory, as the leak around the one used kept the left lung from deflating, until the bronchus was opened.

CASE NO. 3. A boy aged 3 years and 9 months needed open drainage of a left empyema thoracis two weeks after appendicectomy for obstructive appendicitis with generalized peritonitis. A 5-mm endotracheal tube was cut as before to reverse the bevel, but instead of a hole for the upper lobe bronchus, a segment was cut out of the end of the tube as shown in figure 1B. This tube tended to pass into the left main bronchus, possibly as a result of mediastinal distortion, but by rotating the patient's head to the left the tube was positioned to inflate the whole of the right lung. A position was found beyond which advancing the tube obviously obstructed the upper lobe bronchus. The left lung did not remain inflated when the chest was opened.

ANAESTHETIC METHODS

In each case ventilation of the lungs was maintained with nitrous oxide and oxygen, using the Rees modification of the Ayre T-piece (Rees, 1959). Tubocurarine (0.5 mg) was administered when the tube was in the trachea in Case 1, before the left main bronchus was intubated. In the other cases induction was by a sleep dose of thiopentone followed by tubocurarine (0.7 mg/kg) intravenously. Controlled hyperventilation was continued throughout operation, and curarization reversed with atropine (0.02 mg/kg) and neostigmine (0.07 mg/kg) before extubation. No difficulties other than those mentioned in the descriptions of the cases were encountered.
FIG. 1
A. The metal director used to guide the tube into the left main bronchus in Case 1.
B. The tube used in Case 3.
C. The tube used in Case 2.

FIG. 2
The left main bronchus is held open by forceps, while the right lung is inflated.
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REFERENCES


FIG. 3
Radiograph showing the position of the safety pin in Case 2.

DISCUSSION

Techniques of paediatric anaesthesia have advanced rapidly in recent years and procedures which have become routine for adults are being adapted for use in infancy. Bronchial intubation is rarely required in young children but on occasions a large air leak or a lung abscess lead one to consider this manoeuvre. Selective intubation of one main bronchus was carried out in these patients quite simply. The problems of air leak and secretions could probably have been overcome by positive pressure inflation once the chest was open, but in the second case the bronchotomy was rather close to the carina and in the third there was a possibility of flooding the trachea with infected material when the chest was first opened.

L'ANESTHESIE ENDOBRONCHIQUE CHEZ LES JEUNES ENFANTS

SOMMAIRE

On décrit l'intubation selective d'une bronche principale pendant la thoracotomie chez 3 jeunes enfants. Des sondes endotrachéales modifiées ont été employées pour intuber la bronche souche gauche chez un nourrisson porte d'une fistule bronchopleurale droite, et la bronche souche droite chez deux enfants de 3 ans, dont l'un avait un corps étranger dans la bronche souche gauche et l'autre une pleurésie purulente gauche. Dans trois cas la technique a été simple et satisfaisante.

ENDOBRONCHIALE ANÄSTHESIE BEI KLEINKINDERN

ZUSAMMENFASSUNG

Es wird die elektive Intubation eines Hauptbronchus für die Thorakotomie bei drei Kleinkindern beschrieben. Bei einem Kleinkind mit einer rechtssseitigen bronchopleuralen Fistel wurde für die Intubation des linken Hauptbronchus ein modifizierter Endotrachealtubus verwendet. In gleicher Weise wurde bei zwei Kindern im Alter von 3 Jahren, das eine mit einem Fremdkörper im linken Hauptbronchus und das andere mit einem linksseitigen Pleurazempyem, der rechte Hauptbronchus intubiert. Das Verfahren war in diesen Fällen einfach und zufriedenstellend.