Acute Respiratory Tract Obstruction in Children

Zahoor Ahmad,
Consultant Otolaryngologist,
National Iranian Oil Hospitals, Ummeidiya, Khuzistan, Iran.

Abstract

35 cases of acute respiratory tract obstruction in paediatric age group who needed surgical intervention in the form of bronchoscopy, tracheostomy or both are reviewed here. All these patients were seen and managed at National Iranian Oil company Hospital Ummeidiya Khouzeestan Iran, from April 1985 to April 1988. The results obtained with a review of use of instruments is described. Most of the patients presented with foreign body inhalations, some due to allergic oedema and one case had laryngeal cyst causing respiratory tract obstruction.

Acute respiratory tract obstruction is one of the most frequent and important causes which leads the patient to the emergency rooms of the hospitals. The most frequent causes of such obstruction being foreign body inhalation. In the past the mortality rate in such cases was very high, but with the advent of modern

instruments and specialized techniques the mortality rate is greatly reduced. Fibreoptic endoscopes have not much role to play in these cases especially in removal of foreign bodies, these endoscopes serve to fulfill the diagnostic purpose. Use of proper sized bronchoscopes with proper catching forceps have also reduced the

incidence of thoracotomy in removal of foreign body from bronchial tree.

Material and Methods

35 cases of acute respiratory tract obstruction were seen in the department of otolaryngology of N. I. O. C. Hospital Ummeidiya Khouzistan Iran, who needed surgical intervention for the relief of their respiratory tract obstruction. This is a 130 bedded hospital with a catchment population of 300,000 having a fully equipped otolaryngology department. All these patients were brought in the emergency room except ten patients who were referred from paediatricians either from their clinics or from the wards. The patients referred from the wards (6 in number) were kept under observation by the consulting paediatricians and they subsequently developed acute respiratory embarrassment and three of them had cyanosis while they were being observed by the consulting doctors.

All the patients were in paediatric age group, the youngest being 22 days old and the eldest was of 12 years of age. The male : female ratio was 3 : 4. All were muslims and ethnic group was as under :-

Arabs :- 20, Persian : - 15

The cause of acute respiratory tract obstruction was as follows:-

1. Foreign bodies : 20
2. Laryngeal Oedema : 14
3. Supra Laryngeal Cyst : 1

Symptomatology

The following findings were seen in these patients isolated or in combination :

(Presented in order of frequency)

1. History of foreign body inhalation.
2. Acute respiratory embarrassment.
3. Cough.
4. Wheezing
5. Cyanosis.
6. Signs of consolidation and or atelectasis.
7. Convulsions.

Radiography was helpful only in 57% of cases. Out of 20 cases with foreign bodies 6 cases (30%) showed

either radio-opaque foreign bodies or radiographic signs of consolidation or atelectasis.

All the cases of laryngeal oedma showed reduced airway space, two cases were not subjected to radiological pre-operative diagnosis because of their critical conditions as both of them were cyanosed and were having convulsions. The decision to perform tracheostomy and or bronchoscopy was made by the concerned otolaryngologist in all the cases 21 cases of respiratory obstruction were subjected to bronchoscopy, out of which 20 cases were foreign bodies and one case was of laryngeal oedema in whom decanulation was difficult after tracheostomy and the patient had developed right lower zone consolidation. 14 cases of laryngeal oedema were subjected to tracheostomy as in all these cases the conservative treatment either in the form of i. v. steroids, local vasoconstrictor sprays and oxygen inhalation had failed to relieve the obstruction and had infact become worse during the course of observation. In all these cases of laryngeal oedema the smallest size of endotracheal tube was also tried to relieve the obstruction but could not be negotiated.

The single case of laryngeal cyst under-went aspiration of the cyst through direct laryngoscope and then at later stage when the baby was in better condition and had gained some weight, at the age of three months, the cyst was excised.

During the procedures of bronchoscopy, the tracheostomy tray was kept ready but in none of the cases the tracheostomy was required and the procedure was performed without any complications. The Karl Storz bronchoscopes with appropriate sized forceps were used. All the instruments were checked before use. General anaesthesia was used in all the cases of brochoscopies, this was done without endotracheal intubation as the anaesthesia tube was connected to the side of the bronchoscopes. In tracheostomies either local anaesthesia, I. V. Ketalar or no anaesthesia was used. In all the cases strong suction was always kept at hand. All the foreign bodies were removed by forceps (cupped, crocodile, or others). Fogarty catheter was not used in removal of foreign bodies.

The following types of foreign bodies were found in the tracheo-bronchial tree :-

1. Beads : 7 cases (35%)
2. Watermelon and other seeds : 7 cases (35%)
3. Tomato skin : 1 case (5%)
4. Hair clip : 1 case (5%)
5. Whistle (Interior Plastic portion) : 2 case (10%)
6. Safety pin : 1 case (5%)
7. Buttons : 1 case (5%)

The following are some cases of particular interest in our series :-

Careless parents

A patient of 4 years age, an Arab girl was brought to the emergency department of our hospital with the history of foreign body inhalation (a bead). She had no symptoms or signs of respiratory tract obstruction and her X-ray of neck and X-ray chest were normal. The patient was admitted and kept for observations but after four hours of the admission the patient was taken home by her parents against medical advice, after saying to the incharge nurse that her foreign body has come out or she has swallowed it. Ten days after this episode the same patient was brought to the casualty department with the signs and symptoms of acute respiratory tract obstruction. The patient had severe wheezing, perispiration, intercostal recession and mild cyanosis. We recognised the patient but this time the parents gave the history that the patient had inhaled a fresh foreign body (Bead) about half an hour ago. patient was shifted to the theatre after taking the X-rays which revealed a foreign body in the trachea and the patient respiring (Air-column) only through the hole in the bead.

After anaesthesia an infant sized bronchoscope was passed and the bead was seen impacted in the trachea with a lot of thick secretions around the foreign body. Obviously the foreign body was an old one, probably came up and got impacted. Thick mucous was aspirated by a strong suction and the foreign body got disimpacted and came a little bit up, formed a space around itself, a fine sharp crocodile forcep was passed slowly and the foreign body grasped between its hole and the edge and was taken out. Underneath there were a lot of thick mucopurulent secretions which were aspirated. Patient developed post-operative laryngeal oedema which was

managed by I. V. hydrocortisone and the patient was discharged on third post-operative day.

After removal of the foreign body the parents of the patient were again interviewed who confessed and agreed that the foreign body was old and had not revealed the truth to avoid the administrative complications.

Difficult Extubation

A three year old girl was referred from the paediatric department for her acute respiratory embarrassment and cyanosis. The patient was also seen by anaesthesiologist who had tried to intubate by the smallest sized endotracheal tube but had failed and by the time the patient was seen by us she was severely cyanosed and had convulsions. An emergency tracheostomy was performed on the bed in the ward and a temporary small sized tracheostomy tube was inserted and oxygen connected to the tube. During the procedure the patient got cardiac arrest and was resuscitated. Patient stabilised as soon as the trachea was opened and then the patient was shifted to the theatre and the tracheostomy tube changed to the appropriate size. This patient was given conservative treatment before she was referred to the E.N.T. department but all of this conservative treatment had failed to relieve the symptoms of the patient. The X-ray of the soft tissue of the neck revealed marked sub-glottic air-way obstruction. After third post-operative day we tried to decannulate the patient but she could not tolerate it and got respiratory distress and cyanosis, thus the size of the tube was gradually reduced but it did not help in ex-tubation. On 7th. Post-operative day laryngo-tracheo-bronchoscopy was performed but it did not reveal any significant cause. On the same day the tube was changed and a metallic bivalved tube was used, this was intermittently closed for every one hour and kept open for every other hour till 13th. Post-operative day when the tube was successfully removed and there was no post decannulation complication.

Discussion

Acute respiratory tract obstruction is one of the important cause of death in children, although with the advent of the modern instruments and better medical care this mortality is greatly reduced.

The rigid ventilating bronchoscopes play a great role in removing the foreign bodies from tracheobronchial tree and fibreoptic bronchoscopes mainly have a diagnostic role. One of the complications reported in the literature is post-operative laryngeal oedema after bronchoscopy (Lochart and Elliot) but this complication may be avoided if one number smaller sized than required size bronchoscope is used for the procedure and if the procedure is performed quickly. In our series we had only one case who developed post-operative laryngeal oedema because of prolonged procedure.

Moazam et al and Campbell et al have reported peanuts as the commonest type of foreign body in the tracheobronchial tree in the west, where as Ashoor et al have described watermelon seeds as the commonest foreign bodies in Saudi Arabia.

In our series the commonest foreign body was watermelon seeds and beads (35% each), probably because of more consumption of watermelon in this hot area and beads because of muslim population that posses a chain of beads used for prayers. Mousali has also found watermelon seeds as the commonest foreign body in the tracheobronchial tree in the middle east. The fogarty catheter for removal of foreign bodies is not as useful as it has been published and we have not found it of any use. The basket or the cup forceps or simple crocodile fine forceps were used espacially in removal of beads.

laryngeal oedema, mostly allergic, is managed by conservative treatment but some may land into the fatal complications. In our series some cases who

were under the care of paediatric consultants were referred to us at a stage when their condition was critical, most of them were cyanosed and a few had convulsions. In some patients endotracheal intubation was also tried but failed and the severity of the obstruction had increased due to trauma. Most of such cases needed immediate tracheostomy.

In our series 14 such cases needed tracheostomy. None of them except one had post-operative complication of decannulation and this was over come by changing the tube to metallic type and the patient decannulated successfully after 10 days. One case of congenital supra-laryngeal cyst needed laryngoscopy and excision of the cyst (Cyst was aspirated on first visit to relieve the symptoms), such cases should always be kept in mind when a new born present with symptoms of respiratory tract obstruction and performing direct laryngoscopy should not be neglected in such cases. All tracheostomised patients should be constantly and keenly observed in post-operative period. experienced anaesthesiologist and otolaryngologist with modern instruments reduces the chances for thoracotomy.

Acknowledgement

I am thankful to Dr. H. C. Arora consultant paediatrics for his referral of cases and to Dr. C.R.S. Krishna for his expert skill of anaesthesia and to Dr. Nazir Ahmed for his assistance and to my theatre staff and paediatric nursing staff for their cooperation.

I am also thankful to Mr. Gulshah Nanandgan, chief of the hospital for permitting me to publish this hospital data.

References

1. Ashoor A. A, Baraka M.F, Kholani A.A. (1987) : *Foreign Bodies in the Paediatric Tracheobronchial Tree. Saudi medical Journal* , 8 : 481-486.
2. Campbell D.N. Cotton E.K., Lilly J. R. (1982) : *A Dull Approach to Tracheobronchial Foreign Bodies in Children. Journal of Surgery*, 91 : 178-182.
3. Lockhart c, Elliot J.E. (1984) : *Potential Hazards of Paediatric Rigid Bronchoscopy. Journal of Paediatric Surgery*, 19 : 239-242.
4. Moazam F, Talbert J. L. Rodgers B.M. (1983) : *Foreign Bodies in Tracheobronchial Tree. Clinical Paediatrics* , 22 : 148-150
5. Mousalli H. (1981) : *How to Remove A foreign Body from tracheo-bronchial Tree. British Journal of Hospital medicine*, 25 : 300-305.