Tracheo Oesophageal Fistula Following Blunt Chest Trauma


ABSTRACT: Tracheo-oesophageal fistula following blunt chest injury is very rare. Rarer still is the location of such a fistula in the cervical region. A case of cervical tracheo-oesophageal fistula in a boy following fall from a tree is reported. Sinus bradycardia, refractive to drugs was relieved by repair of the fistula. Management has been described in detail and relevant literature reviewed.

KEY WORDS: tracheo oesophageal fistula; blunt chest trauma.

INTRODUCTION

Tracheo-oesophageal fistula following blunt trauma of chest is very rare. Review of literature up to 1982 shows that only 31 cases have been reported. Vinson reported the first case in 1936. Killen and Collins reported two cases in 1965 and summarised the 17 cases reported up to that date. In 1970, Chapman and Braun published the summaries of a total of 28 cases reported in literature until then. Antkowiak, Cohen and Kyllonen reported two more cases in 1974. Martyn added one case in 1982. In view of the rarity, we are reporting a further case in this paper.

CASE REPORT

S.P., a 9½ year old boy, fell from a babul tree on 17 December 1982. He landed flat on his face over a big stone, which hit against the front of his chest and lower neck. He had a bout of severe cough, haemoptysis and dyspnoea. Except for some swelling of the lower neck, he had no other external injuries. Chest X-ray was taken and he was maintained on parenteral fluids for four days. On the fifth day, when oral feeds were tried, he had a bout of severe cough and choking. After about 2 weeks, a barium swallow was done which showed a tracheo oesophageal fistula at the level of first dorsal vertebra. He was managed with Ryle's tube feeding and transferred to this centre.

He presented with the classical 'swallow-cough syndrome'. He had learnt to spit out saliva frequently to prevent choking attacks. He was being fed through Ryle's tube. General physical examination revealed poor nutrition. Lungs were clinically and radiologically clear. ECG revealed sinus bradycardia. Diagnosil-oesophagogram confirmed the fistula. Bronchoscopy showed the fistulous opening.
about 5 mms in size, in the posterior wall of trachea about 3 cms above carina. At oesophagoscopy air was seen bubbling through this opening, 18 cms from the upper incisors. He was given fortified milk feeds through the Ryle's tube and vigorous chest physiotherapy. Bradycardia was not relieved by oral oxyphenonium bromide. As the fistula showed no sign of spontaneous healing even upto 2 months after injury, operative closure was undertaken on May 18, 1983.

Leakage of anaesthetic gases through the fistula into oesophagus was prevented by positioning the inflated cuff of the endotracheal tube over the tracheal tear, thus occluding it. The patient was placed in thyroid position and cervical trachea was exposed by a low collar incision. Trachea was dissected gently as far down as possible. The fistulous track could not be located. Sternotomy was done and the thoracic part of trachea explored behind the thymus and innominate vessels as far as the carina. But no fistulous track could be seen or felt. Going back to cervical incision, thyroid isthmus was divided and the posterior aspect of trachea re-explored carefully. A few vascular adhesions in this region were divided. Here lay the fistulous track. It was divided, leaving a cuff of tissue at the tracheal end. The resultant tracheal opening, about 5 mms in diameter was closed in a single layer with 4/0 silk transversely. Oesophageal opening was sutured in 2 layers. A fascial layer was lifted off the right carotid sheath and interposed between the two suture lines. Wounds were closed with adequate drainage (2 corrugated rubber drains in the neck and a retrosternal tube connected to water seal).

A nasogastric Levine's tube was passed into stomach. Postoperatively the patient was maintained on parenteral fluids for 2 days after which Levine's tube feeding was started. He made an uneventful recovery. On tenth postoperative day, Dionosil-oesophagogram showed complete healing. Oral feeds were gradually started as soon as the boy regained complete confidence in swallowing. Levine's tube was removed. Within 3 weeks he gained 3 Kgs in weight, and interestingly, his heart rate rose to 90 beats per minute.

**DISCUSSION**

Most of the cases of tracheo-oesophageal fistula following blunt chest trauma, described in literature resulted from high speed traffic accidents. Out of the 28 cases summarised by Chapman and Braun3, 23 (82%) followed automobile accidents and were caused by steering wheel injury of the chest. The remaining 5 were caused by crushing injury of the chest in railway accidents. In our case, the injury occurred as a result of blunt trauma chest sustained after fall from a tree.

In 16 out of the 28 cases, the fistula was located just above the carina. Two cases were associated with a pre-existing oesophageal diverticulum. Cervical tracheo-oesophageal fistula was present in only 2 cases (7%). In our case, the fistula was located in the cervical region.

Seven out of the 28 cases had associated rib fractures, 9 pneumothorax and 16 subcutaneous emphysema. Swallow-cough was the dominant symptom. Onset of symptoms occurred 1 to 20 days (average 5 days) after injury. Our case had no rib fracture or pneumothorax. Minimal surgical emphysema as seen in first chest skiagram was present soon after injury. Swallow-cough syndrome was first noticed on fourth day after injury.

Mechanism of injury, as described by Chapman and Bracin3 and Killen and Collins2, appears to be crushing of trachea and oesophagus between manubrium sternum and the body of an upper dorsal vertebra during extreme forcible compression of chest. Muscle layer of the oesophagus gets crushed, torn and separated from the mucosa. This leads to slow ischaemic necrosis of the mucosa. The mechanism of injury explains two things: a. great preponderance of the involvement of supra-carinal part of the trachea b. delayed onset of symptoms. Martyn3 however thinks