Neonatal Pharyngeal Perforation

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Introduction

Neonatal oesophageal perforation is a rare but life threatening condition. It occurs during routine nasogastric tube insertion, suctioning or rarely during endotracheal intubation. The condition may mimic oesophageal atresia. Associated respiratory distress is due to pneumothorax or pleural effusion [1]. We report a case of a term neonate who presented with a hypopharyngeal perforation that occurred during nasogastric tube insertion.

Case Report

A full term male neonate aged six hours was transferred to our centre from a peripheral hospital. The 2.6 kg neonate was born operatively at term and no resuscitation was required at birth. Nasogastric intubation with an 8Fr polyvinyl infant feeding tube after birth was difficult leading to repeated attempts. The neonate developed respiratory distress and drooling of saliva by three hours of life. A diagnosis of oesophageal atresia was made and the patient transferred to our centre.

On admission, the baby was alert, pink, euthermic, euglycemic but in respiratory distress. A nasogastric tube was inserted with ease and the aspirate was found to be scanty and alkaline. Chest radiograph revealed nasogastric tube located in the right posterior mediastinum in the phrenic recess (Fig.1). In view of the repeated attempts at passing a nasogastric tube, a diagnosis of iatrogenic oesophageal perforation was made. Soon after admission, the neonate was provided critical care support in the form of mechanical ventilation (SIMV, PIP 15cms/PEEP 5 cms of water, FiO₂ 0.4), fluid and electrolyte management, and temperature stabilization in addition to routine newborn care. The neonate suffered a sudden deterioration in condition at 20 hours of life with worsening respiratory distress. Clinical and radiological examination suggested a right-sided pneumothorax which was drained resulting in remarkable improvement.

Surgical exploration 24 hours later excluded oesophageal

atresia or fistula. The nasogastric tube passed through the nose was entering the right thoracic cavity from the root of the neck. This tube was removed and a nasogastric tube was passed via the oral cavity that entered the stomach. Under direct visualisation, a nasogastric tube was introduced from the nose and brought out from the mouth. This tube was attached to the orogastric tube that was manipulated out through the nose in a retrograde fashion and fixed. A chest tube was introduced. The neonate made good recovery postoperatively, was weaned off mechanical ventilation by the fourth day and oral feeds were commenced by fifth day. The chest tube was removed on the fifth post operative day and nasogastric tube after twelve days. A videolaryngoscopy was done which revealed a healing hypopharyngeal lesion (Fig. 2). The neonate was discharged on the seventeenth day of life and on follow up is thriving well without any evidence of complications.

Discussion

Since first described by Eklof [2], there have been several reports of neonatal pharyngo-oesophageal perforations. Most of these are iatrogenic and occur during resuscitation procedures viz endotracheal intubation, nasogastric tube placement and airway

Fig. 1 : Chest radiograph (lateral and anteroposterior) with the nasogastric tube in situ at 16 hours of life

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Fig. 2 : Endoscopic view of the healing hypopharyngeal perforation on 12th day of life.

suctioning [3,4]. This perforation may also occur during assisted breech delivery or trans-oesophageal echocardiography [5]. It is commoner in low birth weight babies and usually occurs in the cervical oesophagus at the level of cricopharyngeus muscle. The oesophageal lumen is narrowest at this point and may get occluded by spasm or reflex constriction of the cricopharyngeus in response to injury or an offending agent [6,7].

A pharyngo-oesophageal perforation in a neonate can present with respiratory distress, drooling, feeding problem or difficult nasogastric intubation mimicking oesophageal atresia. In another group, neonates have a free perforation into the pleural cavity with resultant pneumothorax and pyopneumothorax. Radiologically, pneumomediastinum, pneumothorax, cervical emphysema and ectopic location of a feeding catheter, alone or in combination, is seen in the chest radiographs. Retropharyngeal or subcutaneous air may be observed on a plain film of the neck [8]. The nasogastric tube which is unable to bypass the cricopharyngeal spasm may coil in the neck mimicking oesophageal atresia or course through the perforation to get arrested at the diaphragm as occurred in our case. Rarely the nasogastric tube may overcome the cricopharyngeal spasm and pass into the stomach avoiding the site of perforation, when the diagnosis becomes difficult.

Oesophagography and/or endoscopy are the diagnostic methods of choice. Contrast oesophagography using water-soluble contrast may demonstrate a pharyngeal pseudo-diverticulum created by a local cervical leak, a mucosal perforation extending posterior and parallel to the oesophagus or free intrapleural perforation with spillage of the dye into the pleural cavity.

Cricopharyngeal muscle spasm may prevent passage of the dye beyond the upper oesophagus thus mimicking oesophageal atresia. The filling up of a pseudodiverticulum may also simulate oesophageal atresia. Oesophagoscopy has low sensitivity and may actually increase the size of the perforation.

Most authors agree that surgery can be avoided [9]. A nasogastric tube may be negotiated into the stomach under fluoroscopic control and nasogastric feeds started. An oral contrast study is performed after 7-10 days and oral feeds are started once healing of the oesophagus is demonstrated. Mediastinitis and mediastinal mass formation warrant operative treatment. Complications of oesophageal stricture, bronchopulmonary dysplasia and necrotizing enterocolitis have been reported [10].

We presume the hypopharyngeal perforation in our case was a consequence of nasogastric tube manipulation and early recognition of the condition led to a favourable outcome.

Conflicts of Interest

None identified

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