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Our experience with caustic oesophageal burn in South of Iran

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ABSTRACT

Context: The alkaline oesophageal burn (EB) is a very debilitating injury and common in the southern rural area of Iran, where the air conditioning systems are cleaned with an alkaline liquid, which is accidentally ingested by children. **Aims:** The aim is to share our experiences with caustic injury in children. **Settings and Design**: A 'before' and 'after' clinical trial. **Materials and Methods:** From November 2006-2009, 35 cases of alkaline burns were referred to our center. All underwent flexible endoscopy and thereafter received steroid, antibiotic and H2 blocker. They subsequently underwent rigid oesophagoscopy, with grade IIb or higher burns, for inserting the two different kinds of stents. **Results:** Four out of 10 (GIIa <) underwent dilatation occasionally. Fifteen (GIIb) with early large stent (eight weeks) developed complications (three antral contractures, one oesophagotracheal fistula, one tracheobronchial fistula, three perforations, three deaths, and the remaining cases had not undergone dilatation yet. Four out of 10 with (GIIb), who had small stents (Six months) and early gastrostomy needed dilatation every four to six weeks and all recovered, with no significant complications. **Conclusions:** Early use of gastrostomy prevents malnutrition in patients. Small size stents are much more tolerable for a prolonged time are not obstructed by saliva that washes the wall of the damaged oesophagus continuously and promotes healing.

Key words: Oesophageal burn, Dilatation, Reflux, Stent

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INTRODUCTION

The alkaline oesophageal burn (EB) is a very debilitating injury and common in the southern rural area of Iran where the air conditioning systems are cleaned by alkaline liquid, which is accidentally ingested by children. These agent usually causes sever strictures and the treatment of strictures after oesophageal burn (EB) is difficult because it requires many dilations and types of stent applications as the first line of treatment. Stents are mandatory so as not to lose the lumen for future dilatations and they have a successrate of 60-80%.[1-5]

It is not possible to predict the presence and severity of oesophageal lesions by the signs and symptoms and diagnostic or therapeutic oesophagoscopy is needed to assess the oesophagus accurately.[6] In this study we want to share our experience with severe types of the burns and how they were treated.

MATERIALS AND METHODS

From November 2006-2009, 12 girls and 23 boys, with a median age of 4.5 (range 8 months-14 years) were admitted with accidental caustic alkaline ingestion in our Centre. They were treated with antibiotics (clindamicin + cefteriaxone), IV antisecretory compounds (anti H2-blockers or proton pump inhibitors), and IV fluids. Corticosteroids were administered to all cases with (grade > I) in the acute injury phase. We had used paediatric upper GI fiberopticn endoscopes (Pentax 780FG-16V) and dilatation devices (Savary dilators, balloon catheters). The children were followed up and assessed endoscopically and a contrast study was done for the degree of oesophageal strictures. They underwent dilatation, when needed.

Group 1

Only ten cases with oesophageal burns (G< IIa) received conservative management without stenting and were dilated when needed.

Group 2

Fifteen out of 25 (G > IIB) underwent stenting with a chest tube (#28-32 french) that was advanced over a guidewire with the use of an endoscope in the early injury phase, without gastrostomy for eight weeks. They also received antibiotics, steroids, parenteral nutrition, and every two week dilatation during the 6-12 months. They were followed by a barium swallow, based on the severity of the symptoms. The treatment was considered fully adequate if the oesophageal lumen could be finally dilated to 9-11 mm (savary dilator).

Group 3

Ten out of 25 (IIb) underwent stenting with a small pliable nasogastric tube, with a gastrostomy tube for feeding, in the early injury phase for six months. They also received antibiotics and steroids and their dilatation interval was based on symptom severity and this was followed by a barium swallow.

This method of stenting gave patients the chance of early feeding, better stent toleration, and no plugging of the stent or washing of the damaged oesophagus by saliva. These small pliable tubes had no casting effect on the damaged oesophagus in the early injury phase.

RESULTS

Group 1

All ten patients were cured and four out of ten need dilatations occasionally for mild dysphagia.

Group 2

Fifteen with large stents had been cured after eight weeks, however, all of them developed some degree of cervical stenosis and severe reflux during the barium swallow two weeks after removal of stents. They underwent a prolonged dilatation of eight to twelve months. Three gasterectomies for antral contractures, one oesophagotracheal fistula, one tracheobronchial fistula, three perforations, and three deaths had occurred during the dilatation period. Complications were managed with cervical oesophagostomy and a gastrostomy tube. Three died of nutritional complications. Ten out of fifteen were able to swallow, but still need dilatation [Figure 1].

Group 3

Eight out the ten were cured in a matter of eight to twelve months and two still need dilatation. This group had better toleration of prolonged stenting (> six months) and a wider interval of dilatation and they developed no Severe surgical or nutritional complications [Figure 2].

DISCUSSION

Oesophageal burns that involve caustic ingestion are mainly caused by alkalines. They have solvent actions on the lipoprotein of the cells of the oesophageal wall that help them to penetrate deeply into the tissue.[7,8] Our casese injested a kind of alkaline cleaner, which has been used for cleaning the air conditioning systems. The amount, concentration, and contact time of the caustic agent in our cases, which play an important role in the incidence of strictures, is unknown. Early endoscopy, possibly delayed for 24 hours after ingestion, becomes the cornerstone for planning the proper treatment of these injuries. Frequently the stricture is already well-established and dilatation is performed at a late stage.[9]

In our experience 15 out of 25 (GIIb >) EB were evaluated by endoscopy shortly after the injury, and a large stent, without gastrostomy, was inserted for eight weeks after which dilation was performed at a mean

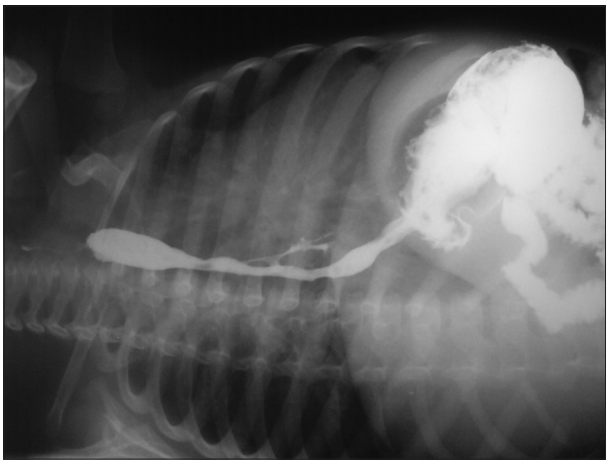


Figure 1: Esophagogram after removal of chest tube as stent

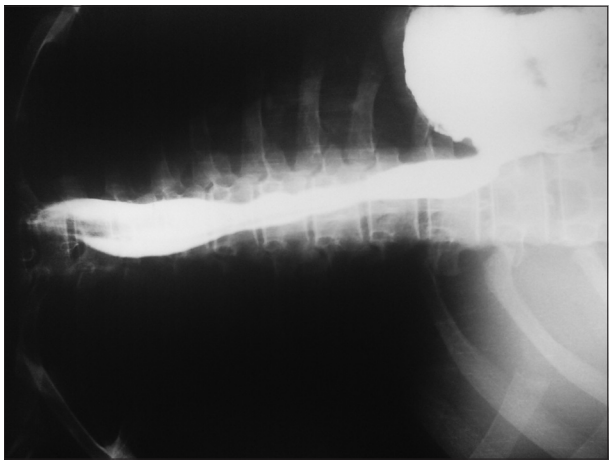


Figure 2: Esophagogram after removal of small NG tube as stent

interval of 8.8 months after ingestion. Although the time delay from injury might not affect the outcomeof the dilatation, we found that earlier and more dilatations increase the incidence of the complication and the chance of oesophageal replacement in our patients. Stricture starts to occur after approximately 21 days, and become firmly established after 45 – 60 days. For these reasons it is advised to perform the first dilatation of the stricture about three weeks after the injury. A nasogastric tube, proposed either for stenting purposes or for enteral nutrition, should never be inserted blindly in the acute injury phase, due to the risk of perforation.[10] In those cases where a chest tube was used as a stent, the saliva was drained through the inside of lumen. They had a good early recovery, however, its casting effect made the oesophagus refluxsive, and, subsequently, more refux burn and stenosis developed.

A small nasogstric tube can be kept for a prolonged time and the saliva will wash the damaged oesophagus, which promotes healing. It can also be used as a guidewire to perform dilatation without the need for endoscopic tools and even when an expert endoscopist is not in place.

The serious nature of the oesophageal injury makes the discomfort and the inconvenience of a gastrostomy always worthwhile in obtaining a successful outcome and minimizing the risks of perforation. Difficult swallowing after caustic soda ingestion may be consequent not only to a narrow lumen, but also to the failure of oesophageal motility, and if early enteral nutrtion doesnot start by gastrostomy tube, it causes severe malnutrition.[11]

The Perforation rate was reported to be 0.47 to 32% in patients after dilatation, as compared to our cases; five out of 15 with chest tube and zero for small tube, which may be because of gentle retrograde dilatation, That were associated with fewer complications. White *et al*., reported five out of eight deaths as compared to our three out of fifteen with chest tube stents and zero for small stents.[12] Our recommendations are early oesophagoscopy for defining the grade and extent of the injury. If the severity is more than GIIb, then we need to insert a small nasogastric tube under the guidance of oesophagoscopy, plus the use of a steroid and antibiotic, and we need to prolong antacid and antireflux agents. We conduct gastrostomy in the same session, as the patients can start feeding earlier, plus one can evaluate the severity of stomach burn.

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