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Selective upper endoscopy for foreign body ingestion in children: An evaluation of management protocol after 282 cases

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Abstract

Purpose: Foreign body ingestion (FBI) is a common problem in both children and adults. This study aims to evaluate a management protocol where endoscopic examination was only selectively employed after routine direct laryngoscopy so as to minimize patient discomfort and the need for general anesthesia in children.

Method: A management protocol for FBI based on symptoms was introduced in 1998 and records of children admitted to a University-affiliated hospital between January 1999 and October 2005 with suspected foreign body ingestion were evaluated. Symptoms, radiological, endoscopic findings and outcome were reviewed.

Results: A total of 282 patients were admitted. The mean age of patients was 5.75 years (age range from 9 months to 17 years). There were 167 boys and 115 girls. Based on our protocol, 84 patients (29.8%) required an upper endoscopy. Fish bones were most commonly involved (68.8%). Foreign bodies were found during upper endoscopy in only 25 patients overall (8.8%), which were either removed or dislodged. All patients had an uneventful outcome. No complications or mortalities were encountered. There were no re-admissions for those who did not undergo endoscopic examination.

Conclusion: It is safe to selectively perform upper endoscopy depending on symptoms when managing children with foreign body ingestion.

Introduction

Foreign body ingestion is a common problem in the pediatric population (1). Serious complications from foreign body ingestion, including sudden death, esophageal perforation, and abscess formation have been reported by many authors (2,3). The nature of the foreign bodies, the presentation, and the management in the pediatric population differ from those of the adult population. Furthermore, in the Asian community, fish bone ingestions are especially common. In this regard, we already showed in our previous review the distinct characteristics of our patients in the locality (4). Based on this review and also the poor tolerance of upper endoscopy in children, we formulated a management protocol for foreign body ingestion where upper endoscopy was only performed selectively. This would firstly, minimize patient discomfort and the need for general anesthesia. Secondly, there would be a reduction of manpower required to carry out the large volume of endoscopic procedures. Nonetheless, the ultimate success of any management protocol depends on its efficacy. Here we aim to evaluate the effectiveness of our protocol after seven years and discuss our findings.

Materials and methods

A retrospective review of all patients admitted to our unit with a history of foreign body ingestion was carried out between January 1999 to October 2005. For all the patients admitted, a strict management protocol based on our previous review was adhered to, as shown in figure 1. Briefly, X-rays of the neck, chest and abdomen were performed after detailed history taking. Upper endoscopy was carried out if foreign bodies were seen and were deemed unsafe to be passed out naturally (e.g.) lithium battery ingestion, or if there was soft tissue swelling seen in the pharyngeal space. Otherwise, the patients all underwent direct laryngoscopy with local anesthetic throat spray. Foreign bodies seen in the oropharynx during this procedure were removed. If direct laryngoscopy was negative, the patients were sent home overnight. The patients were told to return the following morning and endoscopy was only performed if the

Fig 1

patients still complained of localized symptoms.

The demographic data, the site and the nature of foreign body, clinical presentation, radiological findings, and endoscopic management were recorded. χ^2 test was used as appropriate and $p < 0.05$ was taken as statistically significant.

Results

Over the study period, a total of 282 patients were admitted. The mean age of our patients was 5.75 years (age range from 9 months to 17 years). There were 167 boys and 115 girls ($p = ns$). From the history, fish bones were by far the commonest involved object ($n=194$, 68.8%). This was followed by metal objects ($n=45$, 15.9%), such as coins, batteries and hairpins.

Based on our protocol, 84 patients (29.8%) required upper endoscopy, 70 of these were those with persistent symptoms the following morning. In these selected patients, foreign bodies were found during upper endoscopy in 25 patients, which were either removed or dislodged. This gives an overall rate of 8.8% if all patients were taken into account. However, if only the selected patients who underwent endoscopy were counted, the positive rate of finding a foreign body rises to 29.8%.

All our patients had an uneventful outcome. There were no complications or mortalities encountered in those who underwent endoscopy. For the patients who were treated conservatively, they were discharged the following day. There was no re-admission for any of our patients according to the computerized clinical management system.

Discussion

Foreign body ingestion is common in the pediatric population. In 1999, the American Association of Poison Control documented 182,105 incidents of foreign body ingestion by patients younger than 20 years (5,6). In contrast to the peak age of presentation between six months to three years in the Western countries, the mean age in our population was 5.75 years.

We postulate that it may be related to a higher adult to child ratio in the limited living space in our locality, resulting in closer observation of the young toddler. Furthermore, accidental ingestion of bones is a unique problem in the Asian society. In our series, fishbone ingestions accounted for over two-thirds of our patients. This probably is a result of the Chinese custom of eating fish and meat without prior removal of bones (7,8). Based on the findings of our review in 1999, we devised a management protocol for foreign body ingestions in children (4). In contrast to the previous finding that coins were the most commonly encountered objects, we found here that fish bone ingestions were the most common. This may be explained by an increase in parental awareness in keeping potentially dangerous objects out of reach of children since the last review. In devising our protocol, we chose to leave ingested metallic objects for observation, since most of these will pass through the digestive tract and the progress can be monitored by x-ray or stool examination. The exception to this rule is battery ingestion because of the reported complications (9,10). For fish bone ingestion, we assumed that the pain caused by abrasion would subside and that of fish bone impaction would persist. As a result, endoscopy was justified in patients with persistent sensation of foreign body or pain on swallowing after overnight observation. By adopting this selective approach, the positive yield of the procedure to fish bones achieved 29.8%. Although this detection rate is only slightly better than the 27% that had been described (7), we managed to reduce the overall rate of endoscopy to minimize patient discomfort and risk of general anesthesia.

The one disadvantage of the selective policy is that the duration of hospitalization was longer and the children had to spend extra time in the hospital surrounding. This was overcome by allowing the patient to be observed at home. As seen from our admission records, none of our patients managed under this protocol was re-admitted after discharge. We therefore conclude that it is safe to selectively perform upper endoscopy depending on symptoms when managing children with foreign body ingestion.

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Figure legends

Figure 1 – Management protocol for pediatric patients admitted with foreign body ingestion

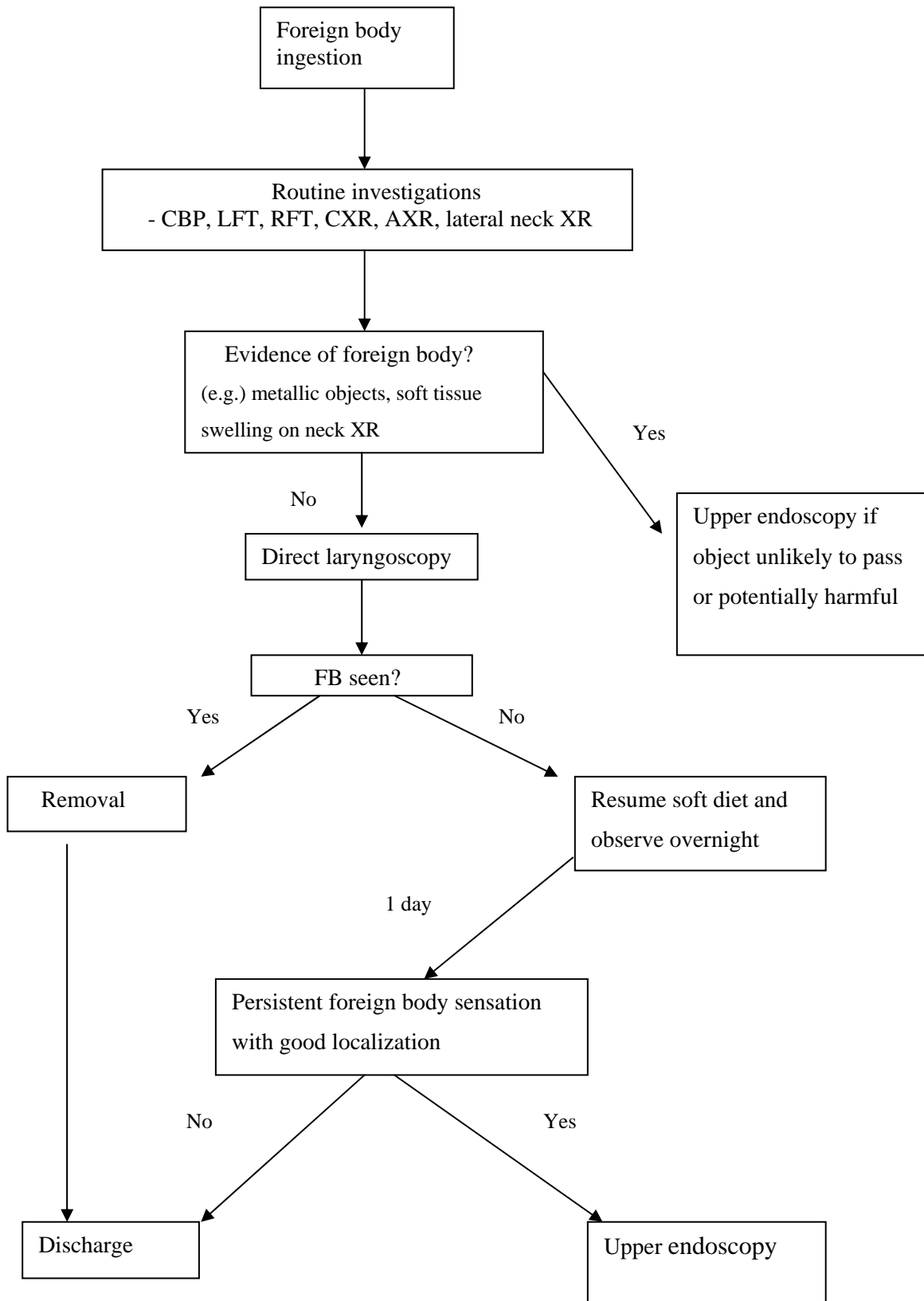


Figure 1