

## SHARP AND IRREGULARLY SHAPED ESOPHAGEAL FOREIGN BODIES: OUTCOME OF ENDOSCOPIC EXTRACTION IN KANO

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### INTRODUCTION

Endoscopic extraction of sharp and or irregularly shaped foreign bodies (SIFB) impacted in the esophagus poses a challenge to the endoscopist. It may be hazardous and is known to be associated with a higher risk of esophageal perforation<sup>1,2,3</sup>. This hazard may be amplified in the face of inadequate equipment, a situation prevalent in resource-limited settings of developing countries. Some impacted SIFB may sometimes have to be extracted by an external approach to minimize complication; this entails an esophagostomy or a laparotomy. Endoscopy however, is the most widely used method of extraction due to its relative ease, lower morbidity and lower complication rates.

This study aims to review the outcome of extraction of sharp and irregularly shaped esophageal foreign bodies at Aminu Kano Teaching Hospital, Kano, over a period when less-than-optimal equipment was in use. This tertiary referral centre was saddled with management of cases of SIFB in parts of North-West and North-Central, Nigeria. The findings may identify factors in patient management requiring attention to improve care.

### Materials and Method

All cases of sharp and or irregularly shaped foreign body impaction in the esophagus presenting to the ENT and Emergency departments of Aminu Kano Teaching Hospital, Kano over a 5 year period (2001-2005) were reviewed. Case notes were retrieved and studied. Notes were made of age, sex, type of foreign body, duration of FB impaction and radiological findings. Intra-operative and postoperative events were noted.

Data obtained was analyzed using simple descriptive method.

**Equipment and Procedure-** Equipment consisted of an esophageal tube, an improvised bronchoscope (for esophagoscopy in infants and young children), a rigid esophageal suction nozzle and a single action alligator grasping forceps.

In all extractions, the foreign body was grasped under direct vision, maneuvered to disimpact from the mucosa, and the esophagoscope-forceps-foreign body complex is withdrawn in a way to minimize further damage. After removal of the FB, the scope was passed again for re-assessment in all

### ABSTRACT

**Background:** Endoscopic extraction of impacted sharp and or irregularly shaped esophageal foreign bodies is associated with higher complication rates and frequent failed extraction attempts especially in resource limited settings.

**Objectives:** To review the management outcome of endoscopic extraction in a resource-limited endoscopy unit with a view to identifying factors in patient management requiring attention to improve patient care.

**Materials and method:** This is a retrospective study of patients who presented with impacted esophageal foreign body to a tertiary health institution over a five year period (2001-2005) at a time when the rigid endoscopy unit was inadequately equipped. Case notes were retrieved and studied.

**Results:** Sixteen (16) cases of sharp or irregularly shaped esophageal foreign bodies (SIFB) were studied, with dentures 7 cases (43.8%) been most common. Age ranged from 10 months to 55 years with a mean of 21.8 years. While 15 cases (93.8%) presented within 12 hours of the incident to the initial health facility, the mean duration of impaction at presentation to our centre was 2.8days. In 15 cases (93.8%), pre-operative plain radiographs revealed accurately the site of impaction. In 12 cases (75%), the SIFB was impacted at the cricopharyngeal area. Fifteen (93.8%) SIFB were endoscopically extracted successfully by consultant otorhinolaryngologist. Mucosal abrasion was the most common complication. No case of esophageal perforation or mortality was recorded. Average hospital stay was 3 days.

**Conclusion:** Success at endoscopic extraction of SIFB can be achieved if the operator is experienced even in the face of inadequate equipment. Factors contributing to successful outcome include pre-operative radiological localization and cervical esophageal arrest of the foreign bodies. Delayed presentation due to referrals arising from paucity of endoscopy centres is common. While training and re-training of endoscopist is emphasized, it is recommended that health institutions in developing countries strive to acquire basic rigid endoscopy equipment.

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cases.

**Post-operatively**-All cases were on nil by mouth for 24hours and thereafter allowed to start clear fluids by mouth, swallowing around the naso-gastric tube. All patients had twice daily review and observed for blood stained saliva, neck pains, vital signs, neck tenderness and subcutaneous emphysema. Neck and chest x-rays carried out on all patients in the postoperative period were reported as normal. There was no case of esophageal perforation. The patients were eventually discharged by the third or fourth post-operative days following complete resolution of their post-operative symptoms. Patients with dentures were referred to the dental clinic for further assessment. Naso-gastric tube was inserted intraoperatively in these cases and removed on the third postoperative day.

### Results

Fifteen (93.8%) of the 16 cases of impacted foreign bodies were successfully extracted by a consultant otorhinolaryngologist at first attempt with the patient under general anaesthesia. There were 16 cases of SIFB out of 39 esophageal foreign body impaction over the period. Denture was the most frequent accounting for 43.8 % ( 7 cases). Table 1 details types of sharp and irregularly shaped foreign bodies. There were 13 males to 3 females. Age ranged from 10 months to 55years with a mean of 21.8years. Eight cases (50%) were above 15 years.

Mean duration of impaction at the time of presentation to our centre was 2.8days. All but one case were referred from other health facilities, and 14 cases (87.5%) presented to the primary health facility within 2-14 hours of the ingestion incident.

Impacted foreign bodies were discernible on plain radiographs in 6 cases (37.5%) and a further 9 cases (56.3%) showed radiological features suggestive of SIFB impaction.

In 12 cases (75%), the FB was located at or just below the cricopharyngeal sphincter or upper third of the esophagus, the remaining 4 cases (25%) were located more distally. One of the distally located FB (a sewing needle) passed on into the stomach and had to be retrieved eventually via a laparotomy.

In 13 cases (81%), mucosal bruising/erosion with minimal bleeding from the impaction site was noted. No intrinsic esophageal pathology was seen.

Table 2 details postoperative review/ findings. Neck pain/tenderness was the commonest complaint encountered 13 (81.3%), followed by blood stained saliva, 7 (43.8%).

**Table 1:** Types and frequency of irregular foreign bodies.

Type of foreign Body(SIFB)	Frequency (%)
Denture	7 (43.75%)
Meat bones	2 (12.50%)
Needles	2 (12.50%)
Chicken bone	1 (6.25%)
Fish bone	1 (6.25%)
Screw	1 (6.25%)
Metallic spring	1 (6.25%)
Metallic ring	1 (6.25%)
<b>Total</b>	<b>16 (100%)</b>

**Table 2:** Post endoscopy review/ findings.

Clinical feature	Frequency (%)
Neck pains/ Tenderness	13 (81.3%)
Blood stained saliva	7 (43.8%)
Subcutaneous Emphysema	0 (0%)
Abnormal vital signs	0 (0%)
Abnormal Postoperative cervical x-rays	0 (0%)
Abnormal Postoperative Chest x-rays	0 (0%)

### DISCUSSION

Denture was found to be the commonest irregularly shaped foreign body impacted in adults, whereas a variety of sharp and or irregular objects such as ring, screws, spring were seen in children. These odd variety of foreign bodies impacted in esophagus have similarly been reported in other studies<sup>3-7</sup>.

This study observed that while nearly 90% of patients presented initially to a health facility within 24hours from where they were subsequently referred, a delay of 1-4 days arising from the referral was common, with children presenting on average 4.25 days after the referral. Similarly, Nwaorgu et al noted that only 54.5% of adults with dentures reported within 48hours of impaction in Ibadan<sup>1</sup>. However, reports from other centres revealed duration of impaction at presentation to within 24hours of the incident<sup>8,9</sup>. Clearly, the referral system in our setting plays a role in late presentation of our cases. Complications such as esophageal perforation from impacted foreign bodies were reported to be more likely with delayed presentation<sup>3,10,11</sup>. In this study however, no complications directly attributable to delayed presentation were recorded, nevertheless the risk remains real.

In 6 cases (37.5%), plain radiographs of the neck and chest confirmed and localized the radio-opaque FB and in a further 9 cases (56.3%), tale-tell signs such as air trapping, straightening of cervical spine and tracheal compression were discernible giving a rough guide regarding the site of impaction. All dentures in this study were radiolucent, however these tell-tale signs were observed on the radiographs which subsequently proved to accurately localize the site of impaction, this finding has similarly been reported by Firth et al<sup>12</sup>. The attachment of wires to dentures aid detection of dentures by x-rays<sup>13</sup>. In 15 (93.8%) of the 16 cases in this study, the site of impaction was accurately localized based on radiographic findings. Only in the case of fishbone ingestion was the x-

ray reported as normal.

In this study, 75% of the impacted foreign bodies impacted at the region of the cricopharyngeal sphincter. This frequent site of impaction has similarly been reported by others<sup>11,14,15</sup>. Impaction at this site may partly explain the ease of extraction in majority of the cases in this study and the good success rates of endoscopic extraction in other reports<sup>1,8,13,14</sup>. Extraction of impacted objects at this site may be achieved with a rigid esophageal speculum and a combination of grasping and shears forceps (for dentures). Shears forceps was not available in our centre, a grasping forceps rather sufficed for all denture extractions. Telescopes were also not available during the period under review. Modern endoscopy teaching techniques and procedure incorporate the use of telescopes<sup>16</sup>. However, despite the short comings, good success rates were achieved at recovery of the irregularly shaped foreign bodies during endoscopy, this could partly be due to operator training and experience.

Extraction of dentures by dilatation method using saline solution-soaked cotton silvers placed around the dentures has been described<sup>17</sup>. Selected group of foreign bodies such as fish bone have been successfully extracted using the flexible laryngo-esophagoscope<sup>18</sup>. More distally impacted SIFB are more technically difficult to extract endoscopically, and external esophagostomy is preferred<sup>1,15</sup>. Though no case of extraluminal migration of SIFB was seen in this study, extra luminal migration of sewing needle or fishbone is not unusual<sup>19,20</sup>. Cases of dentures traversing the entire gastrointestinal tract and recovered in stool have also been documented<sup>13</sup>.

Some degree of superficial mucosal abrasion with minimal bleeding is usual with SIFB extraction however, no significant complication was observed during the procedure in this study, particularly no esophageal perforation occurred. Factors that may have contributed to absence of esophageal perforation in this study included cricopharyngeal location of most SIFB, absence of intrinsic

esophageal pathology, extraction technique and skill of the operator. Predisposing factors to esophageal perforation may include irregularity of a foreign object, delayed presentation, distal impaction beyond upper one third of esophagus, pre-existing intrinsic esophageal pathology, inadequate equipment, poor endoscopy technique and operator inexperience<sup>1,2,3,10,11</sup>.

In conclusion, majority of ingested sharp and or irregularly shaped foreign bodies were radiologically localizable pre-operatively and commonly found to be impacted in the region of cricopharyngeal sphincter. Extraction of these proximally located SIFB by trained personnel even with less-than-optimal equipment was relatively safe and not accompanied with significant complication. Delayed presentation from referral system is common.

In low resource settings, emphasis should be placed on adequate training of personnel on the procedure of rigid esophagoscopy, along with determined resolve to acquire basic rigid esophagoscopy equipment.

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