Abstract: The ingestion of foreign bodies occurs frequently in adults. Patients with psychiatric disorders, prison inmates and elderly people, especially those who have decreased cognitive function, are individuals at risk for this condition. This study looks at soldiers as an additional risk group. Soldiers seem to be an interesting adult patient group with unusual ingestion and ingested material characteristics. In this study, we retrospectively collected data from 35 soldiers treated in a military hospital for ingested foreign bodies. All ingested foreign bodies were metallic and opaque, moreover most were sharp and pointed. Except for six patients with psychiatric disorders all patients declared that they swallowed objects accidentally. An additional characteristic is their swallowing of mostly sharp and pointed objects. Thirteen patients underwent a surgical removal, in four patients the foreign body was extracted by endoscope and in the other 18 patients spontaneous passage occurred. Soldiers appear as a risk group that previously has not been described for foreign body ingestion.

Key Words: Foreign body ingestion, spontaneous passage, operative treatment, endoscopic removal, soldier

Patients and Methods:

The medical records of 35 patients admitted to the emergency surgery division of the general surgery department between January 1997 and July 2006 with a diagnosis of FB ingestion were investigated retrospectively. Age, occupation in the army, type, number and size of ingested FB, previous psychiatric disease, reason and manner of ingestion, duration of complaints, signs and symptoms, radiological and laboratory findings, passage time of the FB, treatment modalities, results of these therapies and complications were evaluated and discussed. Data was collected from patient charts. Statistical analysis was done with SPSS for Windows 12.0 (SPSS, Inc, Chicago, IL)
Table 1: Characteristics related to foreign body ingestion

<table>
<thead>
<tr>
<th>Reason of ingestion</th>
<th>Treatment Modality</th>
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<tbody>
<tr>
<td>Accidental</td>
<td>Spontaneous passage</td>
</tr>
<tr>
<td>Intentional</td>
<td>Operative treatment</td>
</tr>
<tr>
<td>During an epileptic seizure</td>
<td>Endoscopic removal</td>
</tr>
<tr>
<td>Type of ingested foreign body</td>
<td>Type and beginning time of complaints</td>
</tr>
<tr>
<td>Pin</td>
<td>Early abdominal pain (within 24 hour)</td>
</tr>
<tr>
<td>Sewing needles</td>
<td>Late abdominal pain</td>
</tr>
<tr>
<td>Safety pins</td>
<td>throat pain</td>
</tr>
<tr>
<td>Nail</td>
<td>No complaint (history to have ingested foreign bodies)</td>
</tr>
<tr>
<td>Screw</td>
<td>Acute abdominal sign</td>
</tr>
<tr>
<td>Surgical blade</td>
<td>Nausea (with abdominal pain)</td>
</tr>
<tr>
<td>Different metal object including needles, nails, wire etc.</td>
<td></td>
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</tbody>
</table>

Results:

Between January 1997 and July 2006, 35 patients were admitted to the emergency surgery division of the general surgery department for FB ingestion. All patients were male soldiers on active military service. The mean age was 20.8 (range 17-23). Twenty-eight patients had ingested FB accidentally, six had ingested intentionally and one during an epileptic seizure.[Table 1] All six patients ingesting FB intentionally had co-existing psychiatric disorders (PD), including reactive depression, reactive anxiety, antisocial personality disorder and mental retardation.
A majority of the ingested FB were hard and metal objects, especially needles. Twenty-eight patients ingested needles. Twelve ingested sewing needles [Figure 1], 13 patients ingested a pin and 3 patients ingested safety pins. One patient ingested multiple metal objects [Figure 2], one patient ingested a surgical blade [Figure 3], one patient ingested a screw [Figure 4] and four patients ingested nails [Table 1].

Four of six patients with PD ingested only needles, one ingested only nails and one patient ingested multiple metal objects (needles, nails, wire etc). Twenty-three patients ingested only one foreign body. The others ingested two or more. While one patient ingested different metal bodies the others ingested only one kind of FB. There was a significant correlation between the number of ingested items and presence of psychiatric disease (p<0.005).

The size of the ingested body varied between 2 and 10 cm (mean 5.4 and median 5 cm). There was no positive correlation between the size of the FB and complaints (p>0.5), kind of therapy (p>0.5) and outcome (p>0.5). The time between ingestion and admission to the hospital varied in a range of hours and years. Fourteen patients had abdominal pain just after the ingestion of the foreign body and 11 were admitted to the hospital on the same day. Six patients consulted a physician in 24-72 hours, 4 patients between 72 hours and one week, three patients between 1-3 months and 6 patients were admitted after 3 months. [Table 1] Ten patients had abdominal pain but the onset of the pain came later. This time period varied between 15 days and 3 years. A patient who had any symptoms during more than one year came to the hospital with abdominal pain. The foreign body (an 8 cm long nail) came out 13 days after the pain started. Two other patients had throat pain just after ingestion and this was the primary complaint. Nine patients had no complaints and were admitted to the hospital because they had a history of FB ingestion. Two patients had nausea additional to abdominal pain. [Table 1] There were no positive correlations between abdominal pain and the size of the ingested material.

Abdominal tenderness was the main finding at physical examination and was positive in 12 patients. Two patients admitted with acute abdominal signs and one underwent surgery after further evaluation. Only one of the 12 patients with abdominal tenderness was without pain.
The radiological evaluation of the patients was done mainly with plain abdominal films. Plain abdominal films were used in all patients for the diagnosis and during the observation period. Computed tomography (CT) was used for the evaluation of ingested bodies which were not moving.

The treatment was non-operative in 22 patients. The swallowed FB passed spontaneously in 18 patients. Only two of these patients had ingested the foreign body intentionally and both these two patients ingested 4 objects. Median passage time and mean hospitalization in this group were 6 days (3-270 days) and 7.3 days (3-22 days), respectively. This period of time was 270 days in one patient. This patient ingested a 3 cm long nail accidentally 8.5 months before his military service had begun and admitted to the hospital with abdominal pain after being a soldier for 15 days. In three patients the ingested FB was extracted endoscopically and in one other patient it was extracted from the posterior part of the right tonsil under direct vision.

Thirteen patients were treated surgically. Two had psychiatric diseases and another had epilepsy. Only one patient was operated for peritonitis secondary to perforation of the jejunum by a nail. The others were operated on because the object didn’t pass spontaneously or couldn’t be extracted endoscopically. In three patients the FB was removed from the extra-luminal area (two from retroperitoneum, and one from peritoneal cavity). The others had foreign bodies which were extracted from the gastrointestinal tract (four from stomach, three from duodenum, 1 from small intestine and 2 from colon). Mean hospitalization time in operated patients was 9.4 days (5-27 days).

Discussion:

Foreign body ingestion is a common problem in children. In some populations, for example the Chinese, some habitual behaviors such as eating fish and meat without prior removal of bones, the ingestion of FB is commonly seen.[1,5,6] It is reported that deliberate FB ingestion is common in prisoners or patients with PD.[4,7] Prisoners ingest FB usually for two reasons. Some are already psychiatric patients or sometimes objects are ingested to harm themselves and gain release from conviction.[3] The question we are left with is why soldiers ingest foreign bodies. In this study six patients with PD ingested the object deliberately. The remaining patients were healthy individuals and reported that the ingestion was accidental. Patients usually reported that they swallowed FB by lip or mouth during some work related to the object such as repairs, sewing or an office activity. These patients were working hard and all ingested the FB at their work. FB ingestion in adults may be associated with work and habituation for the use of mouth and lip as a third hand to hold objects. All patients were regular soldiers and none had a primary specialized job such as tailoring, carpentry, etc. It is difficult to say that hard work is an independent risk factor for FB ingestion. On the other hand it’s conceivable to suggest that soldiers as a hardworking people may ingest FB to temporarily fall out from military training or service. The mean age of patients is about 21 and by reason of their age they have a tendency to more dramatic solutions for their social problem. Even though the patients reported the ingestion as accidental, all swallowed metal FB. Needles, as mostly ingested FB by soldiers, are accessible, easily detectable by a direct radiogram, small and relatively harmless metal object for this aim. There was a significant correlation between the number of ingested FB and presence of PD. All patients without PD ingested only one FB.

Clinical presentation of patients with FB ingestion may be different. Although some patients had no complaints, a majority of cases (24 of 34 patients) presented with abdominal pain. Only two patients suffered from throat pain. However, Weiland et al. reported that only 49% of their patients had abdominal pain.[4] This study was done at a secondary care facility and usually patients there are referred by a primary care physician. Some asymptomatic patients may have been treated in primary care facilities and that’s why the rate of symptomatic patients may be higher in this series. Also soldiers may have exaggerated the symptoms for secondary gain. The severity of abdominal tenderness varied from mild to moderate. Despite the high incidence of abdominal pain in this series, only two patients that had bowel perforation presented with signs of peritonitis. It is known that only a small proportion (<1%) of FBs cause complications such as bowel perforation.[1,2,8] Sharp and elongated objects are most likely to penetrate the bowel and usually perforations occur at the ileocecal region.[1] Bowel perforation was at cecum in one patient and was caused by a nail. It is reported that intraabdominal perforations of the gastrointestinal tract have a wide spectrum of clinical presentations that may be acute or chronic.[8] However two extra luminal FB did not cause peritonitis.
The diagnosis of an ingested FB is often overlooked in those patients who cannot exactly give information such as children and psychiatric patients.[1,9] Nevertheless the diagnosis of FB ingestion in all six patients with PD was easy and clear. Some cases were even based on information obtained from the patient. Plain abdominal X-rays are useful for detecting the localization of the FB.[3,10] Diagnosis was verified by direct X-ray radiogram in all patients. Passage and movement of FB was also followed with plain X-ray. All patients ingested opaque metallic bodies. However, it should be noted that patients who swallow non-opaque objects, it’s difficult to determine the localization and to follow the course.[1] Computed tomography (CT) is used to detect the exact localization when the object is not moving. CT is able to identify whether an object is in the lumen or not.[1] Magnetic resonance imaging (MRI) is an alternative imaging technique but is more expensive. In this series MRI was not used.

The classical treatment approach is hospitalization with close observation until the FB passes out.[4] It is known that most FB movement is intermittent in the gastrointestinal tract.[1,2,8] Mean passage time for this patient group was 22 days because one patient took 9 months to completely pass the object. When this patient was excluded the mean discharge time was 8.6 days.

Endoscopic removal of FB is widely accepted and used, especially at the early period of ingestion when the object has not passed the pylorus. Some authors reported that endosopical removal is possible in 52% of patients. Weiland reported that only 9 patients out of 22 (75 admissions and 256 foreign bodies) were operated on in their series.[4] It was possible only in four patients to remove the FB endoscopically and 13 patients had operations. Non-operative treatment, especially endoscope removal of foreign objects is preferred for most individuals and conditions. Surgery is a treatment of choice only for objects causing complications or for an immobile foreign body that cannot be removed by endoscope. Complications are caused mostly by sharp and elongated objects.[1]

Conclusion:

Foreign body ingestion is usually a childhood problem but also occurs in adult patients. The FB may be accidentally or intentionally swallowed. Soldiers appear as a risk group previously not described for FB ingestion. The majority of ingested FB passes through gastrointestinal tract spontaneously, but serious complications, such as bowel perforation, peritonitis and obstruction, can occur. Even if soldiers report that the FB was ingested accidentally, the ingestion of sharp, pointed and small metal objects, may provide them with a secondary benefit such as bed rest. In some cases endoscopic or surgical removal may be necessary.

References