

## SWALLOWED PARTIAL DENTURE: A CASE REPORT AND A LITERATURE REVIEW

*Deglutição acidental de prótese parcial removível: relato de um caso e revisão da literatura*

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**ABSTRACT** - Foreign body ingestion is a common occurrence and the majority of foreign bodies that reach the gastrointestinal tract pass spontaneously. However, some patients require non-operative intervention or even surgery. Unexplained abdominal pain should alert the clinician to the possibility of foreign body ingestion. The one-tooth removable partial denture provides no cross-arch stabilization and there is the chance that it may be swallowed if it becomes dislodged. Patients should be educated on the importance of adherence to instructions of mechanics of use, life span, maintenance of dentures, and maintenance recall visits to assess the retention of dentures. It is also important the incorporation of radiopaque material in dental appliances, because the location of a swallowed or aspirated dental prosthesis often is accomplished radiographically. The aim of this paper is to report a case of a patient who swallowed a unilateral partial denture, which was removed by laparotomy.

**DESCRIPTORS** - Partial denture, foreign body, swallowing, laparotomy

### INTRODUCTION

Foreign body ingestion is a common occurrence and the majority of foreign bodies that reach the gastrointestinal tract pass spontaneously. However, 10 to 20% of the patients require non-operative intervention, and 1% or less require surgery.<sup>1</sup> The majority of foreign body ingestion occurs in the pediatric population. In adults, it occurs more commonly among those with psychiatric disorders, mental retardation, alcoholism, those seeking some secondary gain with access to a medical facility, and denture wearers.<sup>2,3</sup> It were reported a case of suicide attempted by ingestion of dentures, ingestion in mentally incompetent patient, and a dislodged fixed partial denture while undergoing general anesthesia.<sup>4,5</sup> Swallowing seems to be more common than aspiration, and is observed most often in the elderly.<sup>6</sup>

Cases of swallowed dental prostheses are occasionally reported in the medical and dental literature. The diagnosis of an inadvertently swallowed foreign body is usually delayed. The ingestion may not result in any signs or symptoms and the denture may be found totally by chance. It

becomes apparent when complications arise, such as throat pain or discomfort, persistent sensation of foreign body in the throat, retrosternal pain, tenderness in the neck, total dysphagia, pooling of saliva in the oropharynx, perforation, abscess or enterocolic fistula formation.<sup>2</sup> The patient could also have sweating and a raised temperature and coughing up blood.<sup>2</sup> Foreign body ingestion should be considered as a differential diagnosis in patients who present with abdominal and constitutional symptoms, and whose laboratory examination results for more common pathologies are negative.<sup>7</sup>

Reported late complications of the undiagnosed swallowed denture include extraluminal migration from the esophagus causing either a diverticulum or perforation (once a perforation has occurred, further severe sequelæ may be anticipated, e.g. tracheo-oesophageal fistula), enterocolonic fistula, sigmoid colon perforation and death.<sup>8-10</sup> It was reported a case in which a removable partial denture was seen seated in the mid portion of the esophagus with its lateral wings deeply embedded in the wall of the esophagus causing laceration and severe hemorrhage.<sup>11</sup>

In cases of complications such as impaction, perforation or obstruction most often occurs at areas of acute angulation or physiological narrowing in gastrointestinal tracts.<sup>7</sup> Risk factors that increase the probability of perforation include the presence of intrinsic bowel disease, such as adhesions, inflammatory bowel disease, tumors, diverticula, hernia or blind segments.<sup>12</sup>

Several techniques for removal of a swallowed foreign body have been reported: endoscopic (colonoscopic or gastroscopic) removal, gastrotomy, laparotomy, rigid esophagoscopy, and cervical esophagotomy.<sup>2,6,7,13</sup>

This clinical report describes a case of a patient who swallowed a unilateral partial denture, which was removed by laparotomy.

### CASE REPORT

A 44-year-old man presented to the Emergency Unit of Odilon Behrens Hospital at Belo Horizonte, after he inadvertently swallowed his one-tooth unilateral partial denture while eating. At the time, he complained of only minimal chest discomfort. He was able to swallow his saliva with minimal discomfort and no significant regurgitation. A chest x-ray (Figure 1) revealed that the partial denture was located possibly in his intestine. As the denture showed pointed and elongated clasps (Figure 2), with a greater risk of intestine perforation, a laparotomy was carried out. The patient's postoperative course proceeded uneventfully.

### DISCUSSION

Usually the diagnosis of an impacted denture is not in doubt, as the patient's history and clinical signs indicate this, as observed in the present case, although two of the patients of Hashmi *et al.*<sup>2</sup> were unable to give an initial history of having swallowed their dentures when presenting with secondary symptoms. This seems by no means unusual, especially in the case of patients with learning and mental health

disorders, which was not the case here. An early challenge is thus posed for the casualty officer who has restricted information to guide the diagnostic process. If it is observed that there are some natural teeth missing, the possibility of a swallowed denture should be included in the differential diagnosis.<sup>2</sup> In the present case, the patient felt minimal discomfort. If the patient had not noticed that the prosthesis had been ingested while eating, perhaps he could never suspect that it had been ingested. Serial radiological follow-up for signs of foreign body migration, intestinal obstruction and perforation is mandatory in the management of these patients.<sup>7</sup>



Fig. 1 - A chest X-ray showing the partial prosthesis location



Fig. 2 - Sharp edges of the prosthesis' clasps.

Several techniques for removal of a swallowed foreign body have been reported. Cervical esophagotomy is a safe method for removing foreign bodies impacted in the cervical esophagus when

they cannot be removed endoscopically.<sup>13</sup> Early diagnosis and treatment will avoid the edematous reaction and mucosal infection and necrosis that heighten the risk of rigid esophagoscopy.<sup>14</sup> Colonoscopy has emerged as an important tool in the management of foreign bodies in the colon, and it allows the retrieval of objects formerly accessible only by surgical intervention. The indications for colonoscopic extraction are obstruction, contained perforation, failure of object to pass through the ileocecal valve and the presence of a pointed or elongated foreign body.<sup>7</sup>

However, these techniques of recovery of swallowed foreign bodies may also have some complications. De Ruiter *et al.*<sup>3</sup> reported complications which occurred in a patient following an attempt to remove a partial denture by esophagoscopy: laceration of the esophagus with subsequent mediastinitis, pneumothorax, and pneumopericardium. This is why in this type of case it is recommended the use of a flexible scope and a flexible hood attachment.<sup>3</sup>

Direct visualization of a swallowed denture with a flexible or rigid endoscope is possible while the prosthesis remains in the hypopharynx or esophagus.<sup>2</sup> However, endoscopic extraction of dentures from the esophagus carries a high risk of perforation.<sup>14,15</sup> Factors responsible for this include the size, rigidity, sharp edges of the dentures, and attempting extraction in less-than-ideal situations. In addition to these, the degree of periesophagitis at the site of impaction may increase the risk of perforation.<sup>14</sup>

All metal partial dentures are readily detected on standard radiographs, but this fact did not prevent one epileptic patient from carrying such prosthesis in the pyriform sinus for eleven months while a series of doctors tried to resolve his complaints of choking, dyspnea and dysphagia.<sup>16</sup> Metal components in a plastic denture, such as wire retainers or clasps, will also aid location on a radiograph,

which was the case here. Clasps should render a partial denture less likely to dislodge but require regular review and maintenance for continuing efficiency.<sup>2</sup> If swallowed, such components are likely to damage the gut lining.

Radiological studies and endoscopic intervention may afford the opportunity to diagnose and remove the foreign body. However, surgical intervention may be needed, as in the present case, because endoscopic removal may not always be successful and can potentially be complicated by massive bleeding and perforation.<sup>7</sup> As the denture in the present case showed pointed and elongated clasps, with a greater risk of intestine perforation, a laparotomy was carried out.

In cases of ingested dental prostheses of acrylic resins, these are often radiolucent, and are difficult to visualize using radiological methods.<sup>3</sup> It may be possible to observe air entrapment around the denture or increase in the prevertebral soft tissues on plain x-rays in cases of entrapment in the esophagus, especially when a local inflammatory response has set in.<sup>15</sup> It is advisable to make removable dental prostheses radiopaque or to avoid using them with the identified risk-group.<sup>3</sup> Poly-methyl-methacrylate, the polymer from which most dentures are made, is radiolucent. Brauer<sup>17</sup> found no plastic radio-opaque material commercially available with physical properties, appearance and ease of handling to match those in radiolucent products. The amount of heavy metal salts and glass fillers that needed to be incorporated was sufficient to weaken the material, thereby increasing the possibility of fracture and the risk of swallowing a denture fragment. These inclusions also affected the appearance of the material.

It was demonstrated the use of 40% poly-2,3-dibromopropylmethacrylate, introduced into the poly-methyl-methacrylate to render the denture base plastic radio-opaque. Because bromine was incorporated into the polymeric structure rather than

present as filler, the strength of the material was less affected. The material does not seem to have been marketed, possibly because of concerns that the halide might have cancer-inducing potential.<sup>18</sup>

Acrylic dentures are more likely to be discernible by CT, since the process is more sensitive to small changes in X-ray attenuation, than by plain radiography.<sup>19</sup> They can also be shown by Magnetic Resonance Imaging (MRI), the difficulty being access to MRI equipment in an emergency.

A denture does not have to be small to be swallowed. Configuration as well as overall dimensions is important. Thus a horseshoe shaped denture swallowed 'end-on' and vertically may well rotate into the hypopharynx and esophagus, though its width would make it difficult to swallow flat and transversely.<sup>2</sup> Such a consideration would explain why swallowing complete lower denture has been reported.<sup>7</sup> But the hazard of swallowing small one-tooth unilateral removable partial denture which provides no cross-arch stabilization is higher.<sup>6</sup> This was probably the main factor that helped in the present case. Thus, the fabrication of such prosthesis should be avoided.

Alternatives include conventional fixed bridge prosthesis and implant supported prosthesis. There remains the possibility that such fixed prostheses will become detached and swallowed but, because they are smaller, have metal components and lack features liable to engage and traumatize the gut wall, such an event is less likely to cause the complications of a swallowed denture.<sup>20</sup> But these alternatives also depend on the economic condition of the patients.

Where a removable denture has to be provided, it should be designed in such a manner as to render it retentive and stable. This consideration is of particular importance in treatment planning for the epileptic patient and those with learning difficulties. The minimal complete lower

denture base reduces both the size and the stability of the denture. For the partial denture, the principles of retention (direct and indirect) and cross-arch bracing are particularly important. Checking over the dentures and undertaking necessary maintenance should be part of the regular dental recall/review process for the patient. Apart from the denture swallowing risk (and for reasons of overall dental health), patients should be advised not to wear dentures at night.<sup>2</sup>

In cases of ingestion of dental instruments or materials, the first step to prevent is awareness of the potential for this problem. The most common prevention techniques include the use of barriers (such as a rubber dam) and ligation of objects to be used intraorally if they carry some risk of ingestion. Knowledge by the dental team of the signs and symptoms of a swallowed object, retrieval techniques, documentation and proper medical follow-up are all essential to the proper management of ingested objects. In cases of minor instruments and materials without pointed or elongated structures, they can be managed by watchful waiting and the ingested foreign bodies came out in the stools without complications.<sup>20</sup>

Patients should be instructed on the importance of adherence to instructions of mechanics of use, life span, maintenance of dentures, and maintenance recall visits to assess the retention of dentures. The use of fractured denture fragments and Superglue to fix such dentures should be avoided. Moreover, over a period of years, the patient may have more teeth removed but still wear the same denture. In this case, a new removable prosthesis should be made.

## CONCLUSIONS

Configurations as well as overall dimensions of the prosthesis are important factors when considering the probability of accidentally swallowing it. The hazard of swallowing a small one-tooth unilateral removable partial denture which provides

no cross-arch stabilization is higher. Thus, the fabrication of such prosthesis should be avoided.

**RESUMO** - A ingestão de corpo estranho é uma ocorrência comum e a maioria dos corpos estranhos que chegam ao trato gastrointestinal sai do organismo espontaneamente. Entretanto, algumas situações necessitam de intervenção não cirúrgica ou mesmo uma cirurgia para sua remoção. Dor abdominal inexplicada deve alertar o clínico da possibilidade de ingestão de um corpo estranho pelo paciente. A prótese parcial removível unilateral não fornece estabilização bilateral no arco dentário e existe considerável chance de que ela possa ser ingerida se for deslocada. Os pacientes devem ser instruídos sobre a importância da observação às instruções da mecânica de utilização da prótese, seu tempo de vida, sua manutenção e do retorno às visitas de manutenção, para avaliar a retenção de suas próteses. É importante também a incorporação de material radiopaco em próteses dentárias comumente feitas somente de acrílico, porque se engolidas ou aspiradas, muitas vezes sua localização é realizada pelo exame radiográfico. O objetivo deste artigo é de relatar o caso de um paciente que engoliu acidentalmente a prótese parcial removível unilateral, que foi removida por laparotomia.

**DESCRIPTORIOS** - Prótese parcial removível, corpo estranho, deglutição, laparotomia

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