Management of an Accidental Ingestion of a Manual Screwdriver in Implant Dentistry: A Case Report

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Ingestion of foreign bodies in dentistry represents an uncommon but possible event and can be life-threatening. An 82-year-old patient presented at our attention for an implant-supported rehabilitation of the maxillary arch. During the placement of the fixed prosthesis, the manual screwdriver was swallowed by the patient. From the moment of the accident, the patient did not develop any symptoms and was monitored for the following days. The instrument was not recovered within 3 days, thus a series of consecutive abdominal X-rays were performed revealing that the screwdriver was located at the level of ileocecal valve with no signs of progression. The screwdriver was removed with colonoscopy under sedation. During this treatment, a polyp was discovered and excised revealing a tubulovillous adenoma depicting low-grade dysplasia.

To prevent such accidents, screwdrivers in implant dentistry should be secured with ligatures, or replaced with longer torque control wrenches.

Introduction

A possible complication during dental treatment is the ingestion of dental instruments.¹ This is possible due to different factors such as supine position of the patient, saliva production, age (children less than 5 years old and elderly people), psychological and neurological diseases,²-⁴ wide oropharynx, and absence of gag reflex.¹ Ingested dental instruments vary in shape and size and can include burs, root pieces, teeth, brackets, endodontic instruments, and implant components.⁵ Usually, swallowed foreign bodies pass through the gastrointestinal system asymptptomatically and are expelled via stool in 2 to 4 weeks.¹ The transit time increases with long and irregularly shaped foreign bodies with a safe passage rate of 63 to 80% for objects with < 3 cm of length.⁶ Although rare, complications may appear and in the 75% are located either at the ileocecal valve or at the rectosigmoid junction.⁷⁻⁸

In these cases, the aid of gastroenterologist is mandatory, and a surgical intervention is needed. Endoscopy retrieval of foreign bodies has a success rate of 94 to 98%; however, complications may happen.¹⁰ The aim of this article is to report a case of a manual implant screwdriver ingestion and to offer support on the management of such cases.

Keywords
► case report
► ingestion
► implant screwdriver
► adenoma
► implants

Case Report

Our patient, an 82-year-old Caucasian male, came to visit with a chief complaint of masticatory problems due to the absence of numerous teeth and asked for a complete rehabilitation of its oral cavity. The patient had a previous medical history of benign prostatic hyperplasia, hypertensive cardiopathy, and had a pacemaker implanted. He refereed he had a history of tobacco smoking but ceased tobacco use years ago.
prior to the current entry. He did not consume alcohol. At the
time of our examination the patient was taking budesonide
160 µg and formoterol fumarate dihydrate 4.5 µg by dry pow-
der inhalation (daily) and acetylsalicylic acid (100 mg daily).
In December 2019, the patient received an “all-on-four”
intervention involving the maxillary arch and the following
day the immediate loading of the reinforced acrylic prosthe-
sis was performed. During this occasion the prosthesis was
tightened with a torque of 10 N at the multiunit abutments
using a torque controller (Anthogyr, Sallanches, France) and
the accesses temporized with Teflon and Cavit (3M ESPE, St.
Paul, Minnesota, United States) (Fig. 1). No complication
occurred. The patient was reviewed after 7 days for suture
removal. While tightening one of the screws of the upper
distal abutments with a manual screwdriver (Nobel Biocare,
Zurich, Switzerland), concomitantly with a sudden move-
ment of the patient, the instrument slipped away and was
accidentally ingested. The patient was in a supine position
and had the perception of swallowing a foreign body. He did
not refer any symptom except for cough. The patient was
reassured and, according to his family doctor, it was decided
to monitor his condition. After 3 days, the patient was still
asymptomatic and reported a regular intestinal transit.
However, the expulsion of the screwdriver could not be con-
irmed. Therefore, the patient was referred to a radiological
center to verify the presence of the screwdriver in the gas-
trointestinal tract. An abdominal X-ray was performed, and
the instrument was detected and located at the level of the
ileoceleal valve. The patient was placed under a fiber-rich
diet and laxatives (macrogol 13.8 g per day) to facilitate the
elimination of the screwdriver. However, two subsequent
abdominal X-rays were repeated after 3 and 6 days which
confirmed the screwdriver was still there, thus an endoscopic
intervention was planned (Fig. 2). The patient underwent
another preoperative X-ray after which he was hospitalized.
Under intravenous sedation full colonoscopy was performed
and a $0.8 \times 2.8$ cm titanium screwdriver was located and
removed (Fig. 3). In addition, during the procedure a polyp
of the cecum was discovered and excised. Histopathological
examination revealed a tubulovillous adenoma showing a
low-grade epithelial dysplasia (Fig. 4). The patient was kept
under surveillance at the hospital for the following day and
the postoperative recovery was uneventful.

**Discussion**

The ingestion and aspiration of foreign bodies during routine
clinical dentistry is well documented and it constitutes a rare
iatrogenic complication. Aspiration is less prevalent than
ingestion and it is considered a medical emergency since
there could be obstruction of the airways and death. Even if
the airways are not compromised, the long-term retention
may lead to death. As for ingestion, swallowed sharpened
objects can potentially cause dramatic complications such as
a digestive tract perforation and thus secondary damages to
the internal organs which can be lethal for the patient.

In some dental specialties, it is possible to reduce the risk
of inhalation or ingestion of dental instruments by isolating
the operative field with a rubber dam, nevertheless a case
of dental clamp ingestion was reported. Moreover, in many
dental interventions the use of rubber dam is not feasible
thus making this inconvenience more susceptible to occur
(e.g., implant dentistry).

Indeed, implantology is a specialty at a high risk of inges-
tion and aspiration since numerous components of small
dimensions are used in each procedure whose surfaces
become slippery once moistened with saliva.

Different strategies can be embraced to avoid this incon-
venience such as packing the oral cavity and the access to
the oropharynx with a large piece of gauze. However, this
technique is more suitable in cases of oral interventions
performed under sedation, while on an ordinary setting it
is less reliable due to the movements of the tongue and in
patients with high gag reflexes. Another strategy is to work
with the patient on a sitting position. While this suggestion
can be easily applied when working on the mandibular arch
it becomes more difficult when the treatment is to be per-
formed in the maxilla since supine position guarantees bet-
ter ergonomics. The most effective safety measure according
to the literature consist of tethering the manual instruments
with floss, sutures, or other ligatures, and it is interesting
to note that some screwdrivers are fabricated with small
holes in the handle for this purpose (Fig. 5A). Another alter-
native that has not been suggested before by scientific litera-
ture is the possibility to use longer torque control wrenches
with the head of the instrument working intraorally and the
handle positioned extraorally (Fig. 5B).

There is not a general consensus for the managing of
ingestion of foreign bodies during dental treatments. In
the present case, since the patient was calm, asymptomatic,
and certain about the ingestion of the screwdriver and

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**Fig. 1** Orthopantomography of the patient before and after the “all-on-four” intervention.
considering the shape and dimension of the object according to the literature examined it was decided for a close monitoring of clinical signs and symptoms and to wait for the expulsion trough the feces. The patient demonstrated to be extremely compliant but since the instrument was not recovered after 3 days a radiographic examination was performed to diagnose the absence of the object or otherwise to monitor the progression of the screwdriver through the gastrointestinal system. This assessment is of paramount importance to avoid an unnecessary endoscopic or surgical intervention. However, in the present case a diagnosis of retention was made, and the endoscopic intervention was performed.

An interesting feature of the present case is the incidental finding of a polyp that was removed contextually with the procedure which revealed an adenoma. Adenomas are identified in 7 to 41% of colonoscopies and 2 to 5% of the polyps that are removed endoscopically contain a malignancy. Adenomatous polyps are precursors of adenocarcinomas and the higher the degree of cellular dysplasia the higher is the risk of a polyp harboring a colorectal malignancy. In the case of adenomas with low-grade dysplasia, complete endoscopic excision of these lesions is curative.

The dental professional accompanied the patient during all the nondental phases of this report, from the radiological assessment to the pre- and postoperative of the endoscopy. From the patient’s perspective this aspect was considered of great importance, and even after the incident, the doctor–patient relationship was not compromised, and the patient is still attending the periodical recall visits.

**Conflict of Interest**
None declared.

**References**