An unusual approach to retrieve right mandibular canine tooth, displaced into submandibular space following fracture mandible, using c-arm

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Received: 10 October 2008 / Accepted: 10 January 2010
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Abstract The purpose of this article is to present an unusual approach to retrieve a displaced tooth. In our patient the right mandibular canine was displaced into the right submandibular space during trauma. The displaced tooth was localized intraoperatively by the use of C-Arm radiography and retrieved surgically.

Keywords Displaced · Canine · Submandibular space · C-arm

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Introduction

Maxillofacial trauma is the common cause of emergency admittance and is frequently associated with displacement of tooth into the adjacent tissues [1]. Early recognition and management can avoid serious complications [2].

In this case, C-ARM, a conventional C shaped radiographic machine (Fig. 1), portable, with a receiving and projecting point. This imaging system device that allows for less patient discomfort and has minimal radiation exposure. This is used mainly in orthopaedic surgeries. It is used for locating and retrieving the displaced right mandibular canine from submandibular space.

Case report

A 35-year-male patient who had met with a road traffic accident was admitted in our hospital. There was bleeding from the oral cavity and associated abdominal injuries with no symptoms of head injury.

On intra-oral examination there was laceration communicating extra-orally in right buccal mucosa revealing comminuted, compound fracture of mandible (right parasymphysis). The mandibular right central incisor, lateral

incisors and canine were found to be missing.

Patient was medically fit and was prepared for open reduction and internal fixation of the fracture mandible along with treatment of abdominal injury. It was an emergency which needed immediate management. Therefore preoperative radiographs were not taken.

Under General Anesthesia (GA), wound debridement was done; upper continuous and lower split arch bars were placed.

Through laceration, exploration was done to expose fracture site and locate the missing teeth which were not found. Fracture was reduced and fixed with monocortical bone plates (Fig. 2) and soft tissue repair was done.

On 4th postoperative day, Orthopantomogram (OPG) revealed anatomical reduction and a displaced right mandibular canine in right submandibular region (Fig. 3). To locate the tooth, a 26 gauge needle was guided into submandibular space using C-ARM (Fig. 4). Under Local Anesthesia (LA) 1cm submandibular incision was made, dissection carried out to retrieve the displaced tooth (Figs. 5 and 6). After thorough irrigation the incision was sutured; a 3–4cm wooden piece was also removed through small incision in right buccal mucosa (Fig. 7).

Discussion

Displacement of teeth into surrounding tissues is an uncommon finding. There are several case reports in the literature describing displacement of the teeth into the infratemporal fossa [3], maxillary sinus, submandibular [4] space, pterygomandibular space [5], lateral pharyngeal space [2,6,7], and lateral cervical region [8], nasopharynx, nasal cavity, and soft tissues of lips and cheek. There are also a few cases describing aspiration of the avulsed tooth [9–10]. An undiagnosed avulsed tooth embedded into the soft tissue may result in chronic, persistent infection [11], discharge and fibrosis.

In addition, inadequately performed or delayed radiological examination may lead to delay in treatment.

The precise location of the tooth is essential to correlate with adjacent anatomical structures. Computed tomography is used with an image intensifier as it makes it easier to locate the tooth and avoids excessive dissection of anatomical structures during retrieval of tooth. Conventional radiographs like PA view, lateral oblique of the mandible and a panoramic radiograph are secondary examinations, for they do not determine the precise location.

Fig. 1 C-Arm

Fig. 2 Fixation after reduction of the fracture

Fig. 3 Arrow showing displaced right mandibular canine tooth

Fig. 4 Intraoperative C-arm radiographic image

Fig. 5 26 gauge needle in place

Fig. 6 Displaced tooth being retrieved through submandibular incision

Fig. 7 The retrieved wooden piece and displaced canine

Some authors suggest that the surgery should be performed 3 to 4 weeks after the accident, allowing an induced foreign body reaction leading to the encapsulation of the tooth with fibrous tissue, keeping it in a more stable position. While the other school of thought is that retrieval should be effected as soon as possible as the late intervention increases the risk of a foreign body reaction, migration of the tooth to deeper spaces and infection [11].

In our case the C-arm was used to locate the tooth as this gives the 3 dimensional view of the tooth and the surrounding structures and has minimal radiation exposure. Another advantage was that constant monitoring was possible by locating the tooth with the needle.

Conclusion

Displacement of teeth in surrounding tissues is an uncommon finding. Because of differences in the direction of displacement, the size of fragment, delay in retrieval, and tissue reactions, no one technique is uniformly applicable [12]. The treatment plan varies from case to case depending upon the clinical situation. This case once more emphasizes the need for adequate preoperative clinical, radiographic assessment and intraoperative exploration of wounds to identify and localize foreign bodies. The use of C-arm

radiography is recommended to localize the foreign bodies in head and neck region.

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