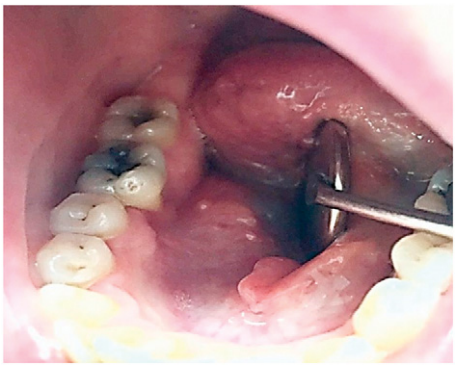

Fig. 2. Postoperative photograph showing the surgical site.

Treatment of the solitary lesion is excision. Local recurrence is reported in up to 31% of the cases.[3] The prognosis of the tumour is typically excellent for solitary myofibromas.

Conflict of Interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Ethics approval not required. Patients' consent obtained.

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Application of a digital guide in the removal of foreign body from the maxillofacial region

Sir,

We report an 11-year-old boy with extensive facial contusions who had had an emergency operation to remove 12 pieces of glass after an accident. Cone-beam computed tomography (CT) showed that there were still 2 pieces left in the right side of his face 2 months later, so we used a digital guide to locate and remove them successfully.

Injuries of the maxillofacial region are common because of its prominence,[1] and foreign bodies can be difficult to remove depending on their size, difficulty of access, and proximity to vital structures.[2]

After the first operation he had complained of abnormal sensation in the right side of his face, and we used cone-beam CT to locate the glass. We removed it using a minimally-invasive method after a 3-dimensional magnesium light Artec Eva (Inition) scanner had been used to obtain his facial soft data. We imported the DICOM data into Mimics 19.0 (Materialise) to make a 3-dimensional reconstruction of the bone, facial soft tissue, and foreign bodies. We saved the data as STL files and transferred them to Geomagic studio 2014 (Geomagic Inc) to design the soft-supported digital guide. We then cut two holes into the guide to locate the foreign bodies and measure their depth (Fig. 1).

We downloaded the STL data into a 3-dimensional printer (FlashForge Guider II, FlashForge) to create the models using polylactic acid. We marked the area with a surgical pen and injected 1% lidocaine 5 ml with 1:200 000 adrenaline around

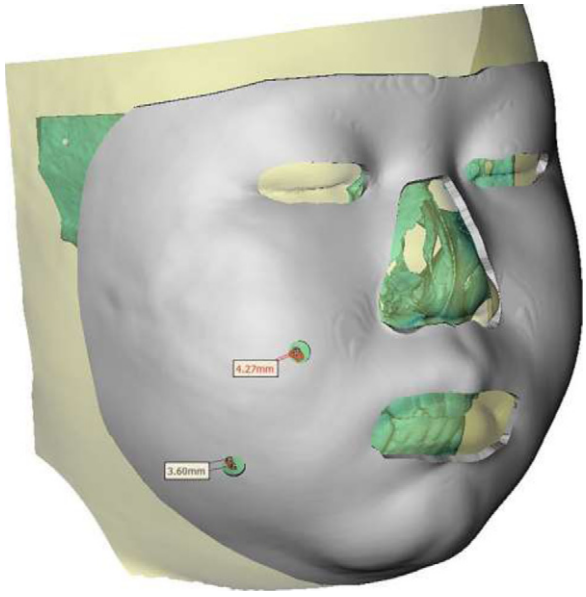

Fig. 1. Three-dimensional reconstruction models and images of the design of the digital guide. The green model shows bones; the red models show foreign bodies; and the yellow model shows facial tissues. The white model shows the digital guide and the measurement indicates the depth from the skin to the foreign bodies.

Fig. 2. The digital guide and the foreign bodies: (A) Three-dimensional printing soft-supported digital guide, and (B) the two pieces of glass that were removed.

it. We disrupted the superficial fascia centrally, found the 2 irregular foreign bodies and extracted them intact (Fig. 2). There was no notable bleeding, however, so we inserted a suction drain and closed the wound in layers. His postoperative recovery was good.

Foreign bodies can easily migrate into the surrounding area, so accurate localisation is essential before removal.[3] Imaging can detect them, but cannot always locate them accurately. Although a navigation system provides a useful guide in oral and maxillofacial surgery, it is not widely used in this clinic, because the equipment is expensive.[4] Removal of a foreign body with a digital guide is personalised, precise, and minimally-invasive.[5] In our experience, the approximation of depth is accurate when the operation is done under general anaesthesia and it has not been too long since the injury.

We recommend the use of a digital guide to remove foreign bodies from maxillofacial soft tissue. Despite the cost and extra time needed for preparation before the operation, the advantages are: reduced operating time, precise localisation of the object, and far less operative trauma.

Ethics statement/confirmation of patient's permission

This study was approved by the Medical Ethics Committee of Kunming Medical University.

The patient's parents gave consent for us to publish the clinical photographs.

Conflict of interest

We have no conflicts of interest.

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