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The novel bone holding technique using thread-tapper device

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Received 30 March 2009; accepted 31 July 2009

KEYWORDS

Tapper;
Open-reduction internal
fixation;
Facial bone fracture

Summary There are several surgical methods and instruments for open-reduction internal fixation of facial bone fractures. We describe a technique whereby a tapper, supplied as part of absorbable fixation instrument systems, is used to manipulate and hold the fractured bone segments. Our facility has used this technique for several years, and we are of the opinion that this novel method is very useful for fragmented small-bone fixation. The described technique simplifies the operating technique by minimising problems associated with the holding of reduced fragments before fixation.

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Open-reduction internal fixation is frequently the treatment of choice for displaced facial bone fractures and many different treatment methods have been described. The reduction techniques commonly used involve the use of a Gillies elevator, a bone hook, a towel clip or similar instruments.^{1,2} However, maintaining the anatomically reduced bone segment securely could be difficult. Currently available instruments rarely allow impacted bone segments to be pulled and held securely after bony reduction, especially in narrow operation fields. The authors usually use an absorbable fixation instrument system for the reduction and fixation of facial bone

fractures. Here, the authors describe a simple technique for reducing and stabilising various facial depressed-fracture segments using the thread-tapping instruments.

Surgical technique

All operations described in this study were performed by one surgeon using the same surgical protocol. Open-fracture reduction under general anaesthesia was performed using standard operative techniques, with the exception that biodegradable plates and screws were used to fix fractures. Briefly, in each patient, after the fracture site had been adequately exposed and reduced, we drilled a hole into the fracture segment anywhere 5 or 10 mm apart from the intended plate fixation site. We then inserted a thread-tapper into this hole in a slightly oblique direction and made it act as a very powerful bone holding device (Figure 1). Without it, the reduced fragment could

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Figure 1 1.5 and 2 mm sized thread-tappers.

easily deviate and become impacted into its prior position. A 2-mm tapper was usually used, and pulled upward acting as a counter-force to the drilling and tapping work during relevant 1.5- or 2-mm plate fixation according to the fracture site. However, care must be taken to avoid excessive force because this could cause the tapper to be pulled or broken. In case the tapper tip broke, it could easily be taken out using a mosquito forceps after burring.

Results

For more than 10 years, this technique has been used at our facility and the results were satisfactory in all patients. The postoperative clinical course of the patients showed uncomplicated healing and bone healing was uneventful in the follow-up radiographic images (Figures 2 and 3).

Discussion

The described fragment-manipulating technique has been used at our facility for more than 5 years to achieve the anatomic reduction of displaced facial bone fractures. This technique is quick, simple and effective for reducing depressed facial bone fractures. After exposing fracture sites, reduction can be a serious problem. When reduction was difficult, an elevator or bone hook was used to obtain gross reduction of fragments, such as zygoma or mandible. Repeated instrumentation insertion in this region to access and reduce a fracture is likely to traumatise soft tissue and lead to oedema and bleeding.³ The described technique is particularly useful for reducing fractures of the mandibular condyle or subcondyle in a narrow operation field. The fixing of a tapper into the proximal

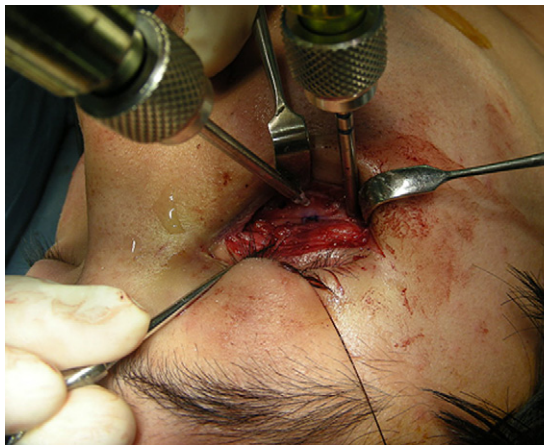


Figure 2 Screw fixation during tapper assistance in the zygoma fracture.

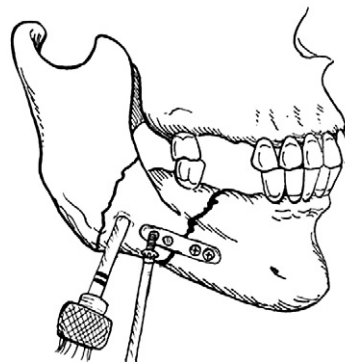
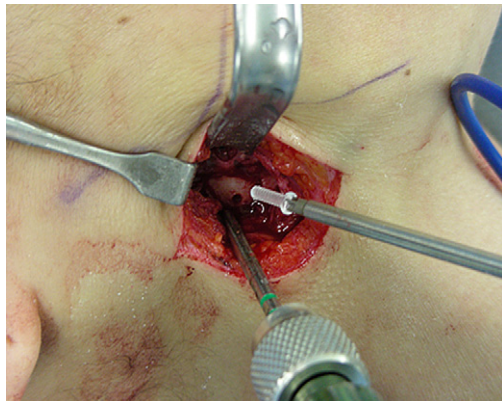


Figure 3 Internal fixation during tapper holding the fragmented mandible.

condyle allows the free-moving segment to be manipulated in all directions and reduces the requirement of soft-tissue dissection. The taper tip length is usually between 7 and 10 mm and could hold the reduced fragment securely without deviation, so we could finely control its direction as in a joystick.^{4,5} It makes internal fixation much easier and demonstrates more reliability than a bone hook or any other device.

Conflict of interest

None.

Funding

None.

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