Orthopaedic Bone Tap: A ‘Jugaad’ for Zygomatic Bone Reduction

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Abstract

Introduction The use of the Carroll-Girard screw in the management of zygomatic complex fractures has been well documented. The instrument provides an excellent degree of control over the movements of the disrupted zygomatic bone. Often mentioned in textbooks and literature, they are not routinely available for the Indian maxillofacial surgeon. This often prevents the regular use of this approach. **Material and methods** We have used the 2.5-mm orthopaedic bone tap that is very commonly available and routinely used in orthopaedic surgeries for reduction of the malar bone.

Conclusion The orthopaedic bone tap is easy to use and functions as an excellent alternative to the traditional Carroll-Girard screw.

Keywords Carroll-Girard screw · Zygomatic complex fracture · Bone tap

Fractures of the zygomatic complex are a commonly encountered form of maxillofacial injury, primarily attributable to the prominence of the zygomatic bone.

As with most facial fractures, there are differing opinions among authors regarding the best treatment approach

and techniques. The ultimate common goal of all treatments is three-dimensional restoration of the altered anatomy [1]. A stepladder concept for the repair of ZMC and isolated arch fractures involves different surgical approaches ranging from limited exposure (including Keen's, Gilles, lateral brow, subciliary) to extended access (coronal, temporal) based on severity of the fracture [2]. Various instruments such as towel clips, haemostats, clamps, different types of elevators (Bristow, Kilner), reduction hooks, Carroll-Girard screws have been used during reduction and fixation for repositioning/manipulation of the malaligned zygoma [2, 3].

Many authors have recommended the use of the Carroll-Girard screw as an effective instrument in mobilizing the zygoma into its proper orientation [3–5].

The Carroll-Girard screw is a special threaded reduction tool, inserted into the zygoma either percutaneously or through the lower eyelid incision [2]. The instrument has a T-bar screw and a broad horizontal handle. Commonly, the screw end of the T-bar is rotated clockwise into a bone hole drilled into the malar eminence and the handle held in the palm to allow multi-directional rotation and manipulation of the zygomatic bone with good control [5]. The insertion point if through a small stab incision through the skin is rarely a cause for cosmetic concern or scars [4].

In the Indian scenario, resourcefulness or more aptly the ability of finding a “Jugaad” is always a useful trait to have. (Now accepted into the Oxford dictionary “Jugaad” implies a flexible approach to problem-solving that uses limited resources in an innovative way).

Healthcare providers in developing nations like India often come up with ingenious ideas in their struggle to provide quality health care to the masses, with limited resource allocation in the state-funded/rural set-ups. Procuring specialized instruments/equipments designed

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Fig. 1 Orthopaedic bone tap 2.5-mm with T-bar. Horizontal handle (a), threaded screw end (b)

Fig. 2 Percutaneous application of the orthopaedic bone tap through skin puncture with sleeve to protect soft tissue

and documented in developed countries is often a difficult task for the Indian surgeon, and they often find their own useful alternatives [6].

We have found that the use of an easily available, low-cost orthopaedic bone tap with T-bar serves as an excellent substitute to the traditional Carroll-Girard screw.

The bone tap is a sharp implement with a threaded end that cuts into the bone to facilitate screw insertion in

orthopaedic surgeries (Fig. 1). Similar to the design of the Carroll-Girard T-bar screw, the orthopaedic bone tap also has a horizontal handle for grasping and a threaded screw. The sharp threaded end of the tap can be used in a manner similar to the Carroll-Girard screw to manipulate the zygoma. It is inserted either percutaneously or through direct access like the transeyelid approaches during open reduction to manipulate the disrupted zygoma effectively in a multi-directional joystick fashion [2]. In percutaneous use, a stab incision of 2–3-mm is placed at the malar eminence, and a hole drilled with 2.0-mm drill. A sleeve is used to protect the soft tissue. An orthopaedic bone tap, 2.5-mm in diameter, is then introduced into the drill hole and inserted with clockwise rotations till it is firmly attached to the zygoma (Fig. 2). It can then be grasped with the horizontal handle to control movements of the malar bone. The bone tap while serving the same clinical function is more easily accessible than the text book prescribed Carroll-Girard screw.

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