## Technical note

# "Under-the-plate" reduction band technique

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We present our experience with metal clamping-bands with tightening-screw mechanisms as temporary intraoperative aids for fracture reduction and the application of fixation implants.

There has been great interest in the use of nylon tie-bands, whether as temporary reduction aids (Schmidt and Davis 1981) or as permanent fixtures (Jones 1986, Tountas et al. 1990). However, one of the major disadvantages of a nylon band is that once it is locked in place, relocation requires that it be cut and a new one applied, since it cannot be released and retied.

Our technique requires the use of commercially available hose-to-pipe metal clamping-bands. These stainless steel clamping bands are readily available in a wide range of sizes. The band particularly suitable for femur or humerus fracture reduction is 180 mm long, 12 mm wide, and 0.5–0.6 mm thick, with a usable diameter of 22–48 mm (Figure 1). The tightening-screw mechanism is attached to one end of the band while the other end inserts into it, thus forming a ring. The screw engages oblique slots on the band. Each clockwise turn of the screw engages one additional slot, thus tightening the grip and decreasing the inner diameter of the band. Counterclockwise turns disengage the screw from the slots until the band is released.

The only modification we needed on the commercially available bands for surgical purposes was to make a wrench that could be securely coupled to the band or removed once the fracture was reduced and the band satisfactorily fixed in place. In addition, a band passer (Figure 2) served as a convenient tool for wrapping the band around the bone. The band, wrench, and passer can be sterilized by steam or gas autoclave.

We use these clamping bands as a fracture reduction/fixation aid for spiral or long-oblique

Figure 1. Commercial metal clamping bands of various sizes.

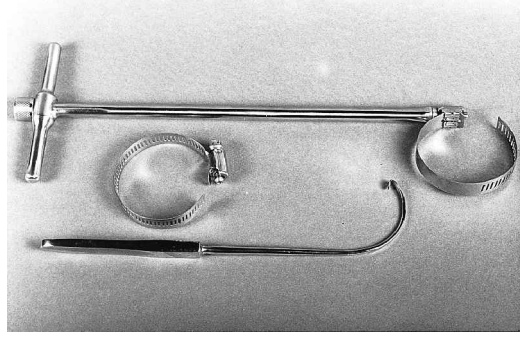
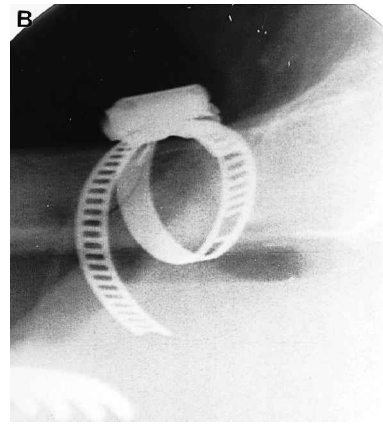


Figure 2. Metal band with detachable wrench, open band and band passer.


Figure 3. A. Spiral subtrochanteric fracture.




B. The same fracture reduced by the band, axial view.


Figure 4. A. Application of permanent fixture over the band.


B. Final result after screw tightening.

fractures of long bones. The fracture site is exposed for internal fixation in the usual manner. The band is introduced around the bone immediately adjacent to the periosteum with the aid of the band passer. The distal tip of the band is then inserted into the screw mechanism and the band is tightened; at the same time, the bone segments are aligned and reduced. The band is then tightened further until firm fixation is attained. At this point, the wrench is removed so as to interfere neither with the surgeon's movements nor with plate placement (Figure 3). Next, the plate is brought into place and secured to the bone by screws at both sides of the fracture. The plate-screws are tightened to about one-half of a turn less than maximal tightening and the band is then opened, as described above, and removed by slipping it out from underneath the plate (Figure 4). The last procedure to be carried out is the final tightening of the plate screws.

The band does not interfere with the manipulations for achieving compression, when the screws are placed eccentrically at the fracture site, or when an articulated tensioning device is used, since the bone segments will readily slide underneath the clamping band.

We encountered no problems in the clinical use of the clamping band. Our experience indicates that operation time is shortened, fewer manipulations are required for performing and maintaining

an accurate reduction, and soft-tissue injury is minimized.

Jones D G. Bone erosion beneath Partridge bands. J Bone Joint Surg (Br) 1986; 68 (3): 476-7.

Schmidt T L, Davis W M. Intraoperative use of nylon bands in fracture fixation. Clin Orthop 1981; 154: 341-3.

Tountas A A, Kwak J M, Kugler M. The Partridge nylon cerclage: Its use as a supplementary fixation of difficult femoral fractures in the elderly. J Orthop Trauma 1990; 4 (3): 299-302.