Proximal Interphalangeal Joint Arthrodesis

Intramedullary Fixation with Diamond Orthopedic Screws

Digital radiographs allow for pre-operative prediction of the optimal screw diameter and length

PATIENT POSITIONING

The patient is positioned supine on the operating table with the arm positioned on the hand table and the fluoroscopy unit opposite the surgeon. A well-padded brachial tourniquet is applied.

SURGICAL SITE PREPARATION

A dorsal midline incision allows for wide joint access. The extensor tendon is split longitudinally in the midline and then released from its insertion onto the middle phalanx.

APPROACH

After release, the joint is flexed to facilitate joint access. Occasionally collateral ligament release is necessary and can be done with a Beaver styled blade. A fine saw blade is used to prepare the joint for fusion by leveling the joint and by creating the preferred angle for fusion. A nice cancellous bone surface is preferred. A trial reduction is done to ensure satisfactory alignment of the fusion and a provisional Kirschner wire can be placed across the joint to maintain satisfactory positioning of the joint during screw insertion.

SCREW INSERTION

A guidewire is placed across the proximal interphalangeal joint either using an antegrade or central placement. The entry point of the guidewire into the proximal phalanx should be approximately 10 mm from the joint surface to limit any risk for distal fracture.

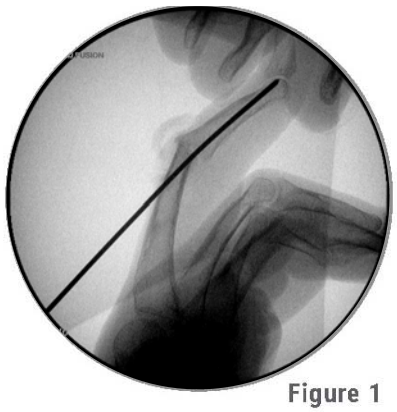

Figure 1

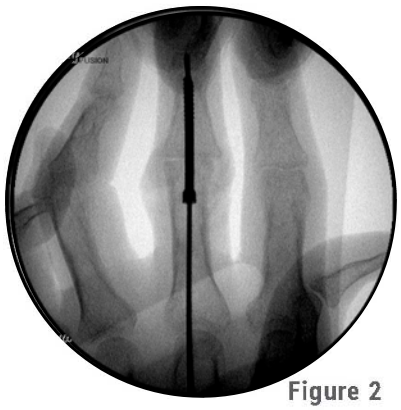

Figure 2

Figure 3

Wire position is verified by clinical inspection & multiplanar fluoroscopy. Screw length is determined with a measuring device and screw selected.

An antegrade drilling technique is used to create the path for the screw. It is helpful to rout the screw insertion point into the proximal phalanx to facilitate screw insertion. Under direct vision, the screw is inserted using the kit driver while maintaining appropriate distal finger rotation with a wire or manual control of the finger. As the screw is inserted over the guidewire, the fusion site is observed to ensure maintenance of alignment and for compression of the bone ends.

Final fluoroscopic examination to check for screw and fusion position.

WOUND CLOSURE AND DRESSING

The extensor apparatus is closed with a running nylon suture technique. The skin is closed with a monofilament nylon suture and a soft dressing or splint is applied to the finger.