A new technique of fixation of radial head fractures using a modified tubular plate

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ABSTRACT

Radial head fractures are fairly common, occurring in 17–44% of all elbow injuries. Mason Type 2 fractures may be fixed using mini fragment screws, this fixation often needing augmentation with a plate to make the construct rotationally stable. However, the drill holes needed to fix the plate to the radial head, carry the risk of inflicting more injury to the fractured fragments. In our case, the radial head fracture was fixed with a modified one-third tubular plate. The plate was cut through the distal hole and the two cut ends were bent into hooks. These two hooks were engaged into two breaches made on the margin of the radial head and this provided rotational stability to the head without causing further damage. The fracture healed well and the patient regained full movement in the elbow. We conclude that this method may be used to fix fractures of the radial head, which require additional support with a plate.

KEY WORDS: Radial head fracture, fixation, tubular plate

Radial head fractures occur in 17-44% of all elbow injuries. Fractures with more than 2 mm of displacement should ideally be treated with open reduction and internal fixation. We present a case of a radial head fracture fixed with a modified tubular plate.

Case Report

A 54-year-old right-handed lady presented with a Mason Type 2 fracture of the head of the right radius. There was an associated displaced fracture of the olecranon (Figure 1). The olecranon fracture was fixed through a posterolateral longitudinal incision using standard tension band wiring technique. The radial head fracture was then exposed by tracing the interval between the anconeus and the extensor carpi ulnaris and by reflecting the anconeus from the proximal ulna. This ensured that the posterior interosseous nerve was protected from injury. The radial head was split into two fragments with slight impaction of the neck. The two fragments were reduced and held with a Herbert screw but the construct was not stable enough and needed buttressing. The non-articulating portion of the radial head was fixed by placing a plate on the radial neck and rotating the forearm through the full range of pronation and supination. There was no impingement of the plate against the radial notch of the ulna. Instead of using a mini T-plate, we used a modified 4-hole one-third tubular plate. The plate was cut across the terminal end of the distal...
hole, leaving the two cut limbs around the hole projecting. These sharp limbs were then shaped into hooks and the plate was contoured to fit the anterolateral aspect of the neck and proximal shaft of the radius. These hooks were then gently tapped into two pre-drilled breaches in the cortex of the rim of the head. The plate was fixed to the shaft of the radius with screws. The hooks stabilised the radial head with a minimum of further trauma and imparted rotational stability to the fracture (Figure 2). Postoperatively, the elbow was supported in a back slab for the first 48 hours after which gentle range of motion exercises were started. After 3 weeks, intensive physiotherapy was started. At 3 months, the fracture had healed and the patient had regained flexion/extension from 100 to 125° and pronation and supination of 75° and 60° respectively. At 6 months, she had regained full range of movement except for the terminal 5° of extension. There was neither loss of function nor radiological evidence of avascular necrosis of the radial head.

**Discussion**

The goal of management of radial head fractures is to provide a stable, painless elbow with as normal a range of motion as possible. Unstable fractures have to be frequently fixed using a mini T-buttress plate to afford rotational stability to the construct. The inter-fragmentary screws may then be passed through the plate to minimise damage to the precarious vascularity of the head caused by excessive drilling. Using a one-third tubular plate in the way described above is another option. It avoids the added trauma to the radial head from additional screws required for fixing the T plate. At the same time, it enhances the stability of the construct. It acts as a fixed angle plate and provides additional support to the head and neck of the radius. In the presence of a fracture involving the radial neck, the plate would buttress the fracture and provide stability. The plate can easily be applied to the non-articular anterolateral segment of the proximal radius without risking impingement of the metalwork against the radial notch of the ulna. However, this method does not provide compression to the fracture fragments and an additional inter-fragmentary screw is required.

**References**