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Bruce Campbell, Section Editor

Technical Section

TECHNICAL NOTES & TIPS

Technical Notes

A simple model to demonstrate the method of reduction and immobilisation of a forearm fracture in an adult or child

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BACKGROUND

Forearm fractures are one of the commonest fractures seen in adults and children. Closed manipulation is usually the first-line treatment for significantly displaced fractures. The method of closed reduction of long bone fractures has been well-described.[1,2] Like any skill, the art of manipulation can only be perfected by observation and practice. A full understanding of the concept behind fracture reduction and immobilisation is crucial to medical training. Teaching models are essential in order to allow students to visualise the concept fully. Charnley initially used wood and leather to described the fracture model.[1] We introduce an alternative teaching model, which is readily available, cheap and easy to understand.

TECHNIQUE

The model was made using 'Collar'n'Cuff' versatile sling material.[1] Take a 30-cm strip. This represents a forearm bone. Cut through the sling material, leaving the outer covering on one side intact. The cut outer material represents the torn periosteum on the tension side of the injury. The cut sponge represents the fractured bone ends. The intact material cover represents the periosteum that remains intact on the compression side of the injury. Overlap the sponge to represent a fully transulated fractured bone end (Fig. 1).

It is impossible to reduce such a fracture by straight-line pull because of the strong fibrous layer of the intact periosteum. Forceful manipulation can rupture the remaining intact periosteum, de-stabilise the fracture and may lead to non-union or malunion. Therefore, to affect a safe reduction, the surgeon must reproduce the deformity at the time of injury. To demonstrate this using our mode, the smaller fragment is manipulated into a position at 90° to the longer fragment (Fig. 2).

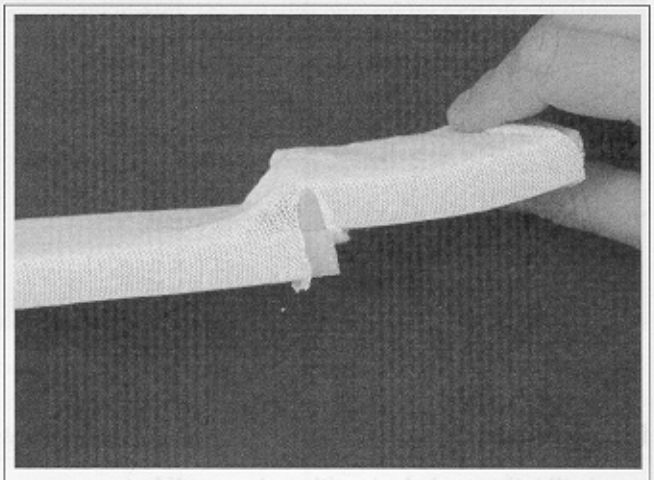

Figure 1 representation of a fully transulated fractured bone end.

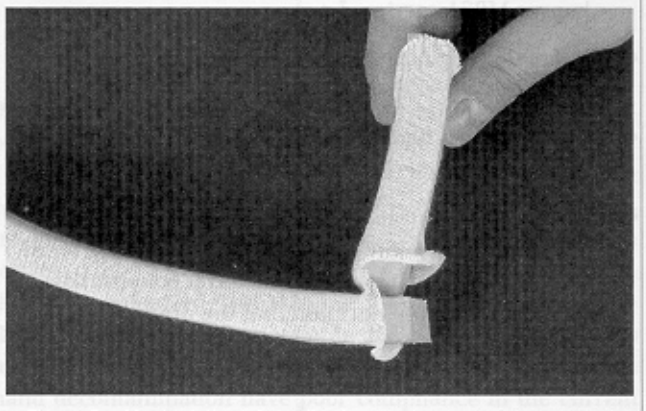

Figure 2 Manipulation of smaller fragment.

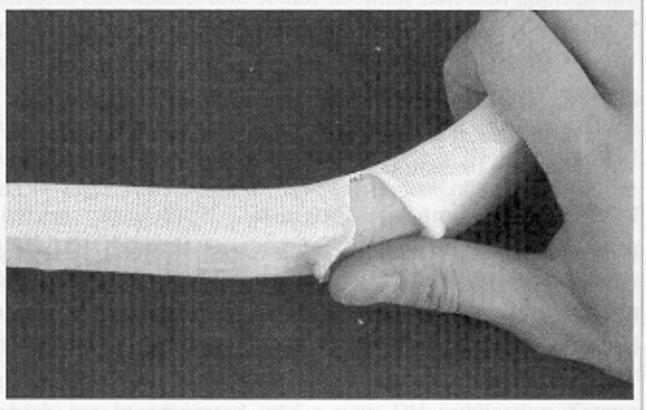

Figure 3 Forceful volar flexion.

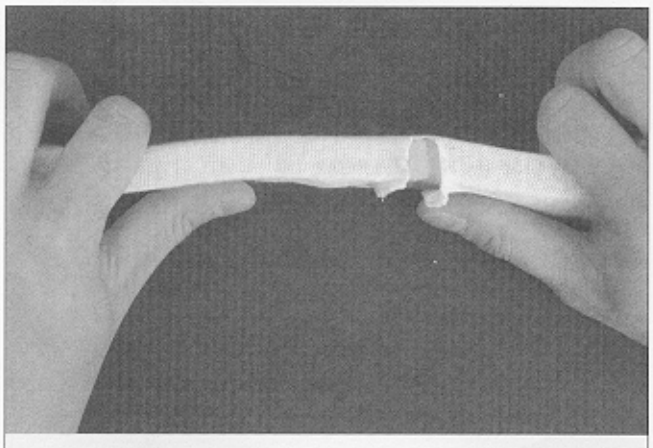

Figure 4 The three-point moulding technique.

To demonstrate the reduction, the sponge is then slid so that the edges match and then the sponge ends reduced. The fracture is then reduced by forceful volar flexion whilst maintaining the traction against the intact material 'periosteum' (Fig. 3).

The three-point moulding technique of plaster cast immobilisation is represented in our model by the three points that maintain reduction against the intact material (Fig. 4).

References

1. Charnley J. *The Close Treatment Of Common Fractures*, 4th edn. Cambridge: Colt Books, 1999.
2. Rang M. *Children's Fractures*. New York: Lippincott Williams and Wilkins, 1983.

A 'Seldinger' method to facilitate accurate placement of an end cap following femoral nailing

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BACKGROUND

End capping of intramedullary nails stops bony in-growth of tissue. We describe a method to facilitate reliable insertion by using a Seldinger technique to maintain access to the upper part of the nail. The equipment needed is already provided in the instrumentation set supplied by the manufacturers of Synthes femoral nails.

TECHNIQUE

The connecting screw of the insertion handle is removed from the nail, leaving the handle supported and engaged in the top end of the nail. A guide wire is inserted through the insertion handle into the upper end of the nail (Fig. 1). The guide wire is retained whilst the insertion handle is extracted from the wound (Fig. 2). The protection sleeve and cannulated trocar for the nail are then advanced along the guide wire down to the nail entry portal. The guide wire and cannulated trocar are removed, leaving the outer sleeve accurately placed over the proximal end of the nail (Fig. 3). The appropriate size of end cap is inserted into the nail through the protection sleeve of the cannulated trocar directly into the nail (Fig. 4).

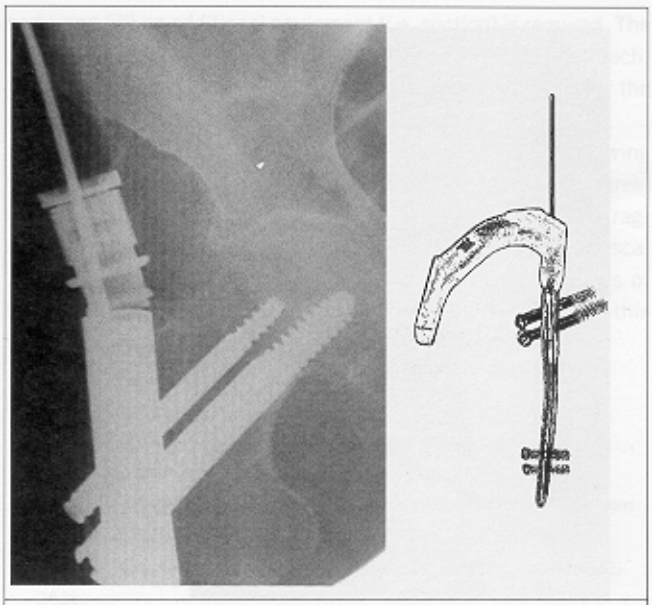

Figure 1 Guide wire inserted through disconnected insertion handle.

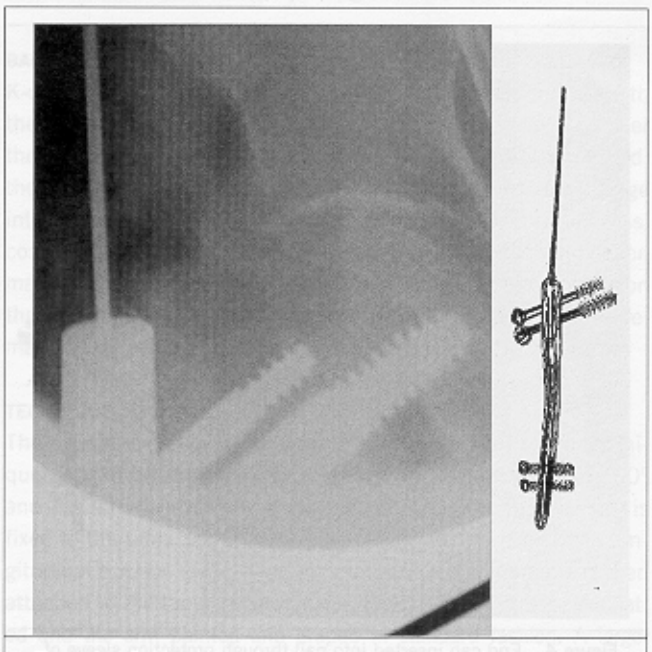

Figure 2 Guide wire retained in nail after removal of insertion handle.