

The use of MRI scans as a guide to treatment of significantly displaced posterior Salter-Harris 2 fractures of the medial end of the clavicle

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INTRODUCTION:

CT scans are the standard imaging modality for the diagnosis and guide to treatment for significantly displaced posterior Salter-Harris 2 (SH2) fractures of the medial end of the clavicle. However, the medial clavicular physes is not visualised on CT imaging and due to the 30° inclination of the sternoclavicular joint (SCJ) it is difficult to ascertain whether there is any residual contact between the physes and the medial end of the clavicle. We have developed an axial-oblique MRI scan protocol angled a 30° to the horizontal and inline with the SCJ to image SCJ bony and soft-tissue pathology. We used MRI scans as a guide to treatment in a series of patients with significantly displaced posterior SH2 fractures of the medial end of the clavicle.

METHODS:

We treated a series of patients with posterior SH2 fractures with displacement of the clavicle onto the posterior vascular structures but without vascular injury on initial CT arteriogram. An MRI scan was undertaken to assess any residual contact between the physes and the medial end of the clavicle. Patients with no contact/off-ended fractures underwent an open reduction and suture fixation and patients with residual contact were treated non-operatively. All of the patients' arms were immobilised for 4 weeks and a repeat CT undertaken. Further CT scans were undertaken at 6 months. At final follow-up SCJ clinical function was assessed using Quick-DASH, Rockwood and SANE scores.

RESULTS: Ten patients (2 female and 8 male) with an average age of 13.6 years (11 – 16) were included in the study. The average follow-up was 42.9 months (24 – 62). Three patients had off-ended fractures and underwent an open reduction and suture fixation. Seven patients had evidence of residual physeal contact and were treated non-operatively. There was evidence of healing callus and no further displacement of the clavicle on CT scan of these 7 patients at 4 weeks. Serial CT scans of these patients demonstrated healing and remodelling of the fracture with resorption of the displaced posterior edge of the clavicle. At final follow-up the mean Quick-DASH score was 0, Rockwood score was 15 and SANE score was 99.5% (95 – 100) and all of the patients considered their SCJ to be normal.

DISCUSSION AND CONCLUSION: In this case series of significantly displaced SH2 fractures of the medial clavicle the use of MRI scans allowed identification of completely off-ended fractures which were successfully treated by open reduction. Fractures with residual physeal contact were successfully treated non-operatively.