Comparison of Crossed Screws Versus Plate Fixation for Radial Head Fractures
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Introduction
Fixation of radial neck fractures can be achieved with a plate and screw construct or, if there is no comminution, with two obliquely-oriented screws. This study investigated the mechanical properties, specifically the stiffness and load to failure, of these two fixation strategies in a cadaver model.

Materials and Methods
Ten matched-pair radii were removed from fresh cadaver arms. A transverse osteotomy was created at the neck of each radius. All right-sided radii were fixed with two oblique headless compression screws; left-sided radii were fixed with a radial neck plate. The distal aspect of each radius was potted in a urethane casting resin. The radial head was loaded in shear in 4 different planes, 90 degrees apart and orthogonal to the shaft using an Instron machine. Stiffness and load to failure were recorded for each specimen.

Results
The stiffness of both constructs was similar in all planes except for loading from medial to lateral where the screw construct was 1.8 times stiffer. Average ultimate failure occurred at 229N for the screws and 206N for the plate. Failure strength was not statistically different. Failure mode for the plate was plate bending while the screws failed by pullout and fracture.

Conclusion
The two strategies provide similar strength and stiffness for the fixation of transverse, non-committed radial neck fractures. While plate and screw constructs are more appropriate for axially unstable or comminuted fractures, two oblique screws might be preferred for simple transverse neck fractures since this strategy requires less exposure and the implant is buried.