INTRODUCTION

- Spiral fractures of the metacarpal are unstable fractures prone to malrotation and shortening.
- These fractures are common and have a wide range of surgical indications: significant displacement, angulation and shortening, in open fractures and in multiple metacarpal fractures.
- A good understanding of fracture pattern is essential to guide surgical fixation.

AIM: To analyze the mechanism of spiral fracture formation by biomechanically inducing a torsional force on a chicken humerus model.

RESULTS

1. 24 out of 30 specimens failed in a spiral pattern along the shaft of the bone. 6 specimens that fractured through the metaphysis were excluded.

2. We observed that all spiral fracture propagated along the same direction as the torsional force applied.

3. There are two distinct components: a helical line that traverses the circumference of the bone and a longitudinal line that connects both ends of the helix. This creates the characteristic spikes of both bony ends as seen on radiographs.

CONCLUSION

The direction of the torsional force applied predicts the direction of the fracture propagation, forming a distinct 3-dimensional spiral fracture pattern characterized by a ‘helical line’ and a ‘longitudinal line’.

CLINICAL RELEVANCE:

- Hand surgeons should be mindful about the fracture configuration and consciously identify the two components intra-operatively.
- Careful and precise screw placement can prevent catastrophic comminution, especially at the ‘spike’ ends.

REFERENCES


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