

Rib Plating Hardware Failure and Surgical Revision

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Abstract

- Surgical stabilization is rising in popularity as a method of treating trauma patients with rib fractures.
- We discuss a 40 YO female who suffered a fracture of her rib plate following a push motion.
- Patient presented with severe pain and underwent successful surgical revision of the fractured rib plate.

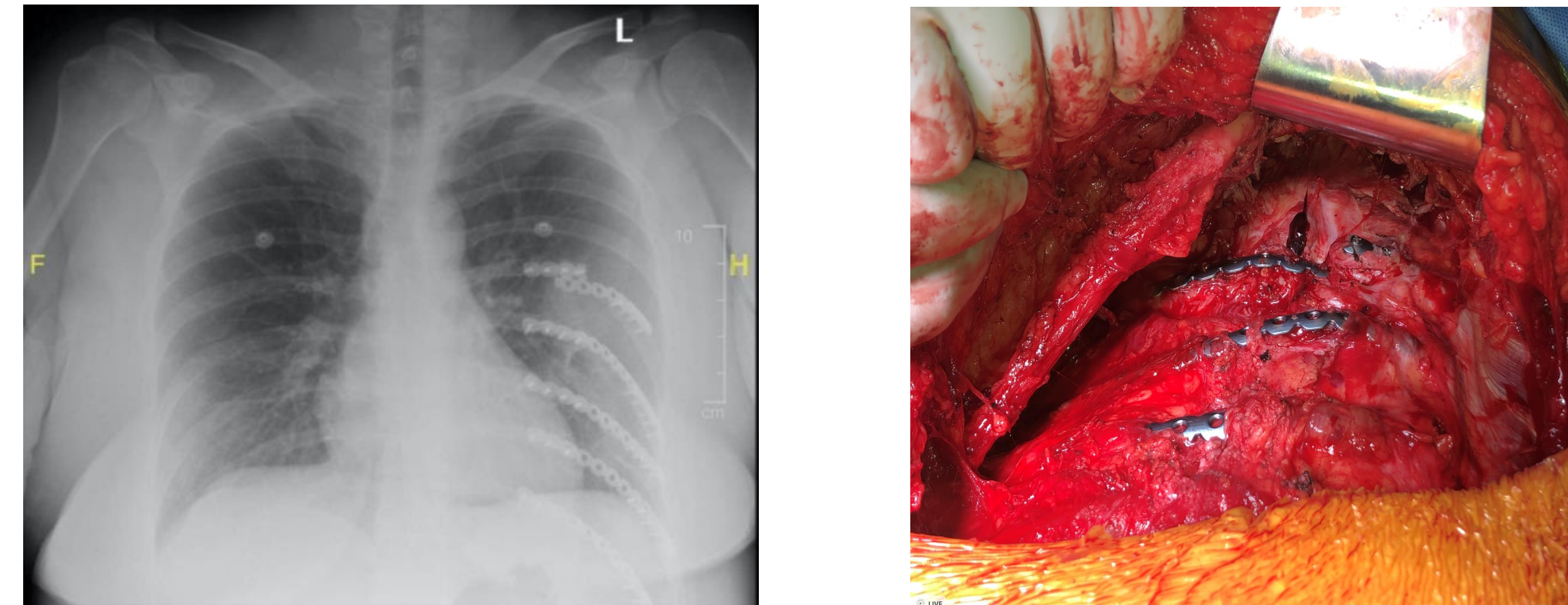
Background

- Rib fractures are extremely common in blunt trauma patients, and 350,000 Americans sustain them yearly.
- Surgical stabilization of rib fractures (SSRF), to include rib plating, is considered in certain cases.
- Plating became a method of choice starting in the 1980's.
- Patients who undergo SSRF generally have favorable prognosis with few adverse outcomes.

Case description

- 40 YO F admitted with left posterior chest wall pain that started after pushing her bed against the wall.
- **PSH:**
 - Rib **resection** and **plating** of ribs # 6-10 one year prior in an outside hospital
 - Surgery was delayed due to pain
 - Ribs were shaved off to remove excess callus and improve alignment
 - Significant gaps between the rib ends
 - Plates were bridged between the ribs
- Physical exam: Tenderness to palpation over the left posterior chest wall without crepitus, ecchymosis, deformity.
- **CT Chest:** Evidence of previous rib-plating and left chest trauma mainly involving the posterior lateral aspects of the left 6-10th ribs.
- **XR Chest:** Metallic plates overlie the left 6-10 ribs. The plate overlying the 6th rib is fractured.

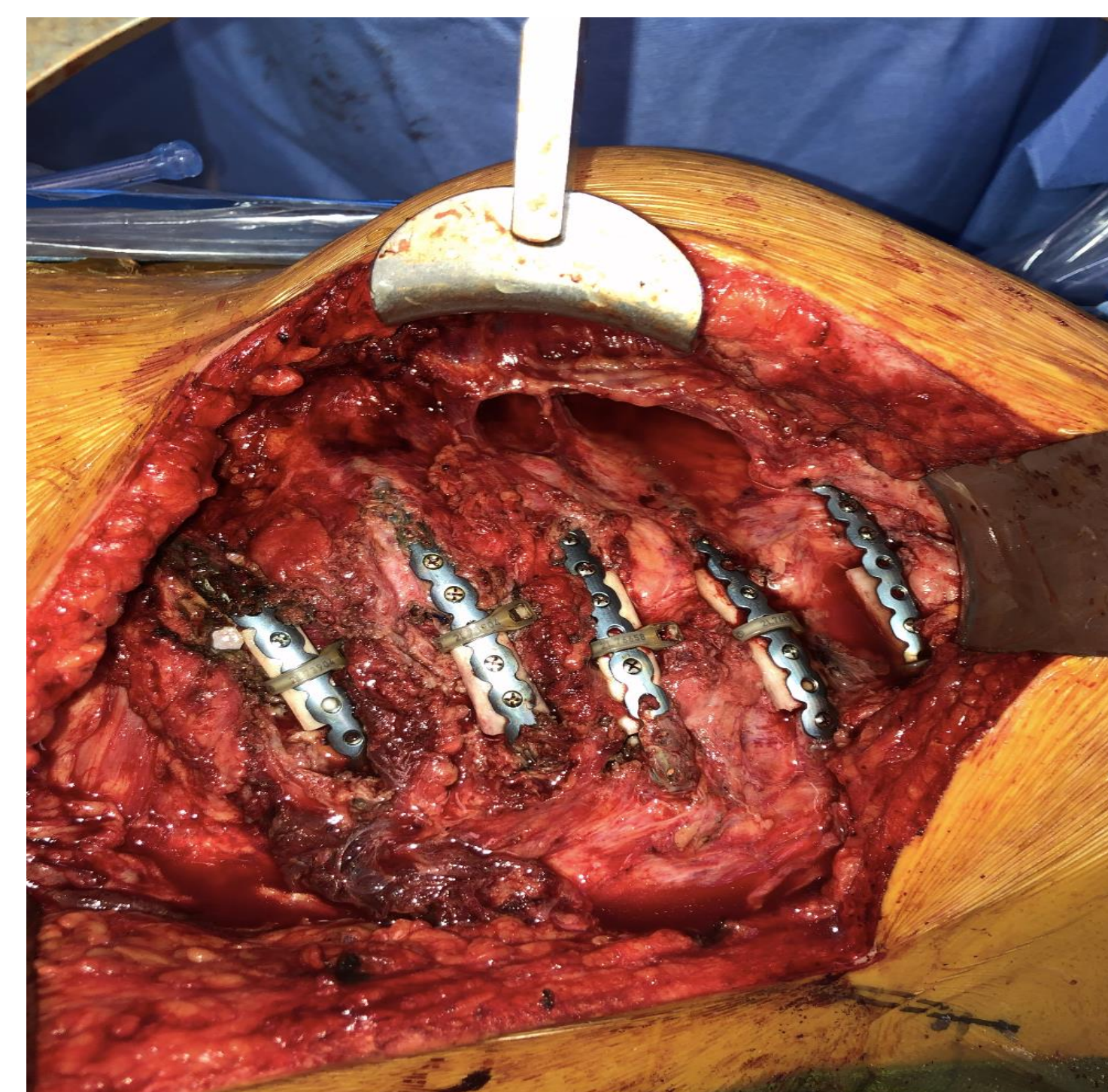
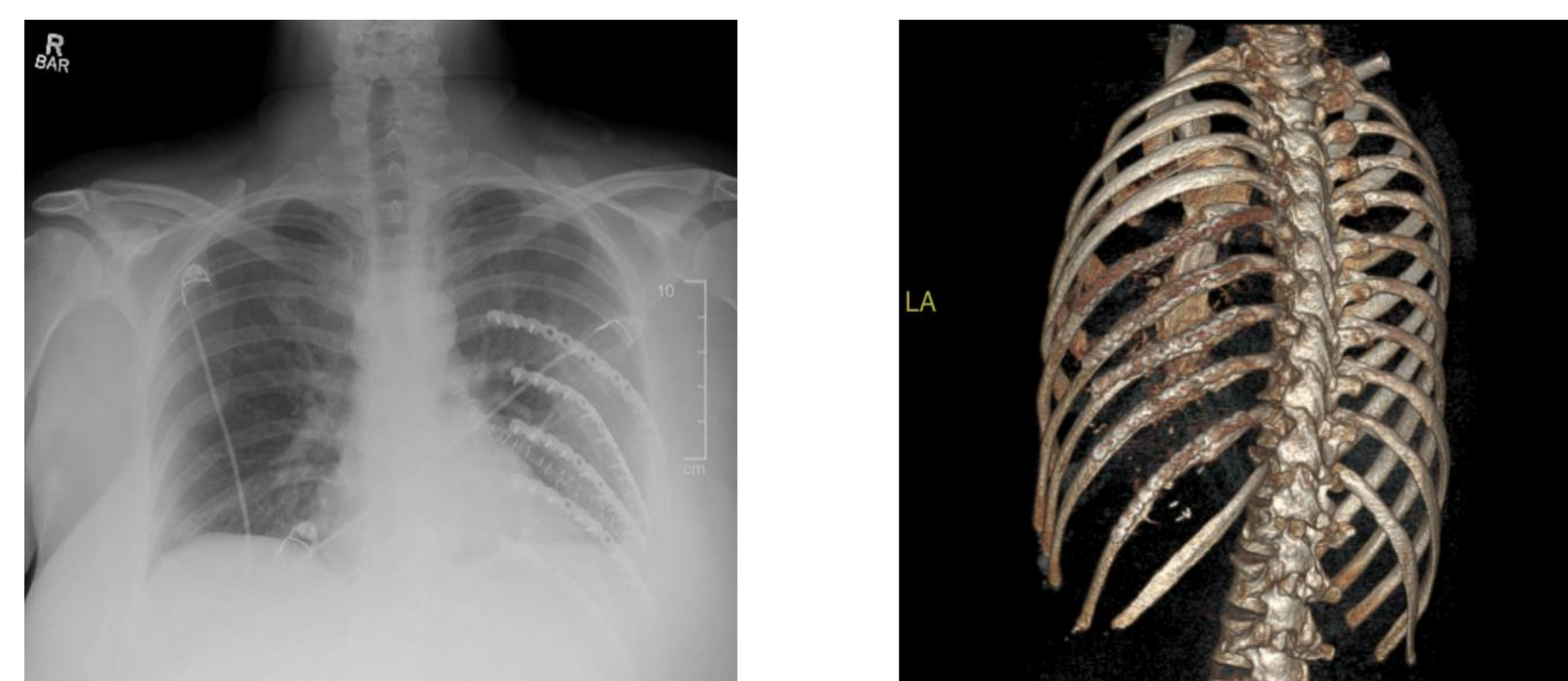
Pre-Op Imaging



Treatment

- Previously placed rib plates were noted and the fractured 6th rib plate was identified.
- The screws and plate on left 6th rib were removed
- Replacement of rib plate for left 6th rib
- Cadaveric bone graft placement to fill rib voids of left ribs #6-10
- Application of prime cellular bone matrix to cadaveric bone graft
- A zip fixation tie was placed around the plate and cadaveric rib to further secure the plate to the rib.

Post-Op Imaging



Discussion and Conclusion

- Uncommon complication of SSRF, a fracture of prior rib plate without direct trauma
- Significant gap between the rib ends with rib plate bridging the ribs together
- One retrospective observational study [3] found that 92% patients had “no significant limitation in any part of their lives” after SSRF, 92% of those employed pre-injury could return to their same job following surgery.
- A study [7] in the *Journal of Trauma and Acute Care Surgery* found that 38 of 1224 patients who had previously undergone SSRF experienced hardware failure, most often in the anterolateral and lateral region.
- Usually, the failure point is either screw movement or fracture of the plate, the latter of which occurred in our patient. Their study noted that 40% of hardware failure patients remained asymptomatic, and only 10% required a repeat SSRF in those patients who failed conservative management.
- The variance in presentation of patients with rib plating hardware failure, and the variance of its durability from patient to patient, is important to consider when evaluating prior SSRF patients as well as when counseling rib fracture patients before surgery.
- Given that rib plating has been proven robust even up against effective chest compressions, more longitudinal data is needed regarding long term outcomes of rib plating and reasoning for variations in presentation, especially in low mechanical stress scenarios.
- In the majority of cases [2,3,6], patients may return to their prior lives without major limitation, but should be counseled to return for re-evaluation should pain or other concerning sensations around their SSRF arise.

References

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