


## Proximal Humeral Fractures: How to Avoid Intra-articular Screws

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### Intra-articular screws

- What is the magnitude of the problem?
- Do we even describe it correctly?
- How do I select patients to minimize this problem?
- Do I always need a locking plate?
- What intra-operative techniques help?
- Now that the screws have penetrated the joint, what do I do?

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### Locking plates – Intra-articular screws

- Voight C et.al. “Management of complications after angularly stable locking proximal humerus plate fixation” Chirur. 2006 - Intra-articular screws 14%
- Owsley KC, Gorczyca JT “Fracture displacement and hardware migration after ORIF of proximal humerus fractures” JBJS 2008 - Intra-articular screws – 23%
- Frangen Et. al. “Proximal humerus fractures with angle-stable fixation - is everything better now?” Zentrabl Chir Feb 2007 - Intra-articular screws 26%

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**RCT's of Proximal Humeral Fractures  
Operative versus Non-operative**

- **Zyto 1997 – 40 pts, mean age 74, 4 yrs f/u**  
- Constant score Non-op 65, OR 60
- **Olerud 2011 – 60 pts, mean age 74, 2 yrs f/u**  
- Constant score Non-op 59, OR 61
- **Fjalestad 2012 – 50 pts, mean age 73, 1 yr fu**  
- Constant score Non-op 33, OR 35

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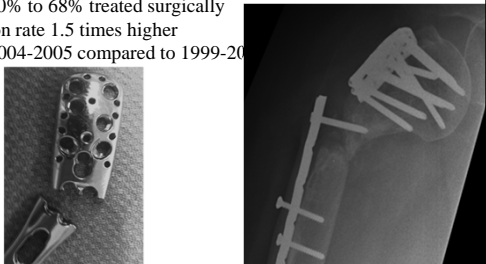
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J Bone Joint Surg Am. 2011 Jan 19;93(2):121-31.  
Trends and variation in incidence, surgical treatment, and repeat surgery of proximal humeral fractures in the elderly.  
Bell JE, Leung BC, Spratt KF, Koval KJ, Weinstein JD, Goodman DC, Tosteson AN.

- Incidence the same but operative intervention increased 25%
- Variation: 0% to 68% treated surgically
- Reoperation rate 1.5 times higher in 2004-2005 compared to 1999-2003




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**My Technique**

- **Reduce the fracture – no varus**
- **Calcar screw important**
- **Don't penetrate far cortex with drill**
- **Close with inferior screws, take some off superior screw length**
- **"Near-far" fluoro in multiple planes before closure**




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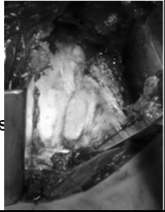
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### Locking plates: Complications

- Jost B, Spross C, Grehn H, Gerber C: Locking plate fixation of fractures of the proximal humerus: Analysis of complications, revision strategies and outcome. JSES 2013, 22;542-549
- 121 patients referred after failure of PHLP
- Mean 3 complications
- 1.5 revision surgeries per patient
- Screw cut out in 57%, glenoid wear in 33%
- "Glenoid destruction by locking screws was the most devastating and previous almost unseen complication, which limited the options of treatment"



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### How to deal with intra-articular hardware

- 47 yr old female
- 2 yrs post #
- Pain
- Stiffness
- Weakness



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Conclusions
<ul style="list-style-type: none"><li>• <b>Select operative candidates carefully</b></li><li>• <b>You are putting in a rigid construct with no intrinsic “give”</b></li><li>• <b>Technique is important</b></li><li>• <b>Still a role for conventional plates in some patients</b></li><li>• <b>Arthroplasty (HA, TSA, RSA) is a reasonable “bailout”</b></li></ul>

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