

# Complications in Shoulder Arthroscopy

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**European Basic Arthroscopy Course**

# Complications of shoulder arthroscopy

- Generic complications of surgery & anesthesia
- Complications specific to shoulder arthroscopy
- Technical errors
- Implant related complications

**Martin CT. 30-day morbidity and mortality after elective shoulder arthroscopy: a review of 9410 cases.**

*J Shoulder Elbow Surg. 2013 Sep 20. [Epub ahead of print]*

- 9410 patients, complication rate 0.99%
- Major morbidity :0.54% (0.04% mortality)
- Minor morbidity: 0.44% (42 patients).
  - Return to the operating room 0.31%
  - Superficial surgical site infection 0.16%
  - Deep infection 0.01%
  - DVT 0.09%
  - Peripheral nerve injury 0.01%
  - Pulmonary embolism 0.06%

## Weber SC. Complications associated with arthroscopic shoulder surgery.

*Arthroscopy. 2002 Feb;18(2 Suppl 1):88-95.*

- More frequent than knee
- Mostly under reported : 5.8-9.5%
- Vascular and neurologic injury
- Fluid extravasation
- Stiffness
- Iatrogenic tendon injury
- Equipment failure
- Iatrogenic fracture
- Capsular necrosis (Thermal shrinkage)

# Cerebral desaturation

- Cerebral ischemia causing neuro-cognitive dysfunction
  - Beach chair position
  - Hypotensive anesthesia
  - Longer operative time
  - Increased BMI
    - *Lee JH. Arthroscopy. 2011 Jul;27(7):889-94.*
    - *Salazar D : Clin Orthop Relat Res. 2013 Apr 19.*
    - *Moerman AT: Eur J Anaesthesiol. 2012 Feb;29(2):82-7.*

# Hypothermia

- Cold OR, hypotensive anesthesia , cold irrigation fluid
- Associated with
  - Patient discomfort
  - Myocardial ischaemia,
  - Surgical site infection
  - Coagulopathy
- Prevention
  - Pre-and peri operative warming
  - Warm irrigation fluids
    - Duff J: BMC Surg. 2012 Jul 20;12:14



# Fluid extravasation

- Frequent with pump use
- Prolonged subacromial surgery
- Usually resolves within 12 hrs
- Rarely
  - Airway obstruction
    - Venkat G: *Orthopedics*. 2009 Oct;32(10).
  - Rhabdomyolysis & renal shutdown
    - Lim JK: *Arthroscopy*. 2006 Dec;22(12):1366.e1-5.



# DVT

- 92 440 patients : 0.038%
  - *Dattani R: Bone Joint J. 2013 Jan;95-B(1):70-4.*
- 65 302 patients : DVT: % 0.01, PE :% 0.01
  - *Jameson SS: J Shoulder Elbow Surg. 2011;20(5):764-70.*
- No prophylaxis necessary unless apparent risk factors for coagulopathy
  - Cancer
  - Family of personal history of coagulopathy
  - Smokers
  - Advanced age
  - Oral contraceptive drugs
  - Obesity



# Infection

## ■ Risk factors

- Multiple steroid injections
- Diabetes
- Rheumatoid arthritis
- Immuno-supressed patients

## ■ Pathogens

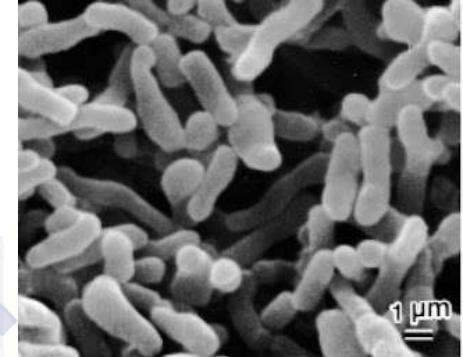
- *Staphylococci*
- *Propriionobacterium acnes*

## ■ Presentation

- Acute
- Insidious



# **Propionibacterium acnes infections**



- Low grade, insidious course (up to 1.8 yrs)
- Unexplained pain and stiffness after surgery
- Absence of pus, low grade synovitis
- Irregular ESR & CRP values
- Anaerobic cultures up to 14 days
- Irrigation & debridement + 6 weeks IV Penicillin / B-Lactam AB
  - Millet PJ: *Clin Orthop* 2011;469(10):2824-30.
  - Schneeberger AG. *Arch Orthop Trauma Surg.* 2012 ;132(10):1387-92
  - Levy PY. *Clin Infect Dis.* 2008 Jun 15;46(12):1884-6.

# Post-arthroscopic glenohumeral chondrolysis

- Rare but devastating
- Young patient (10-40 years)
- Deep pain and limitation of motion months after arthroscopy
- Usually requires arthroplasty
- Risk factors
  - Intra-articular pain pumps
  - Proud anchors
  - Thermal device
    - Hassan SS:Arthroscopy. 2013 Jul;29(7):1135-41.
    - Yeh PC: J Am Acad Orthop Surg. 2012 Feb;20(2):102-12.



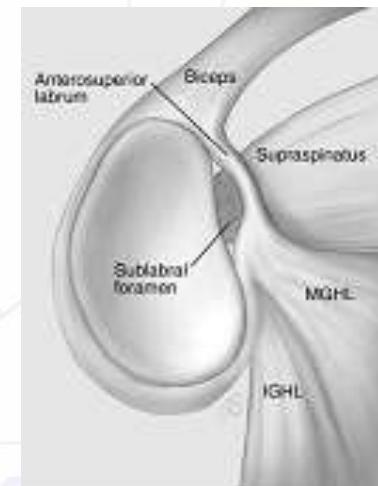
# Axillary nerve injury

- At risk during release of frozen shoulder & inferior anchor placement during Bankart repair
- Most are traction or contusion
  - *Boardman ND. Clin Orthop 1999;(368):44-53.*
- Nerve 10-25 mm from glenoid rim, closest at 5-5.30 o'clock
  - *Yoo JC: Arthroscopy. 2007; 23(12):1271-7.*
- Antero-inferior portal
  - Beach chair : 25.5 mm
  - Lateral decubitus : 21.5 mm
    - *Gelber PE. Arthroscopy. 2007 May;23(5):522-8.*



# Errors in diagnosis

- Buford complex
- Partial/Intrasubstance RC tears
- SLAP lesion
- Capsular laxity
- Glenoid bone loss



**Randelli P. Risk factors for recurrence after Bankart repair a systematic review.**

*Knee Surg Sports Traumatol Arthrosc. 2012;20(11):2129-38.*

- Recurrence after Bankart repair % 3-35 at 10 years
- Risk factors
  - Age 22(-), male
  - Number of preoperative dislocations
  - Participation in competitive sports.
  - Repair with fewer than three anchors
  - Knotless anchors
  - Substantial glenoid or humeral head bone loss
  - Anterior labroligamentous periosteal sleeve avulsion.

# **Randelli P. Complications associated with arthroscopic rotator cuff repair: a literature review.**

*Musculoskelet Surg. 2012 Jun;96(1):9-16.*

- 414 complications in 2,890 patients
- Re-rupture 11.4 and 94%.
- Stiffness 74
- Hardware-related complications 12
- Rare complications
  - DVT
  - Infection
  - Neurovascular



# Risk factors for re-rupture

- Age over 65
- Chronic tear
- Fatty infiltration of SS & IS
- Massive tear size
- Repair under tension
- Lateral extension of acromion
  - *Oh JH: Arthroscopy. 2009; 25(1):30-9.*
  - *Charousset C. Arthroscopy. 2010; 26(3):302-9.*
  - *Zumstein MA. J Bone Joint Surg Am. 2008; 90(11):2423-31*
  - *Goutallier D. J Shoulder Elbow Surg. 2006; 15(2):164-72.*

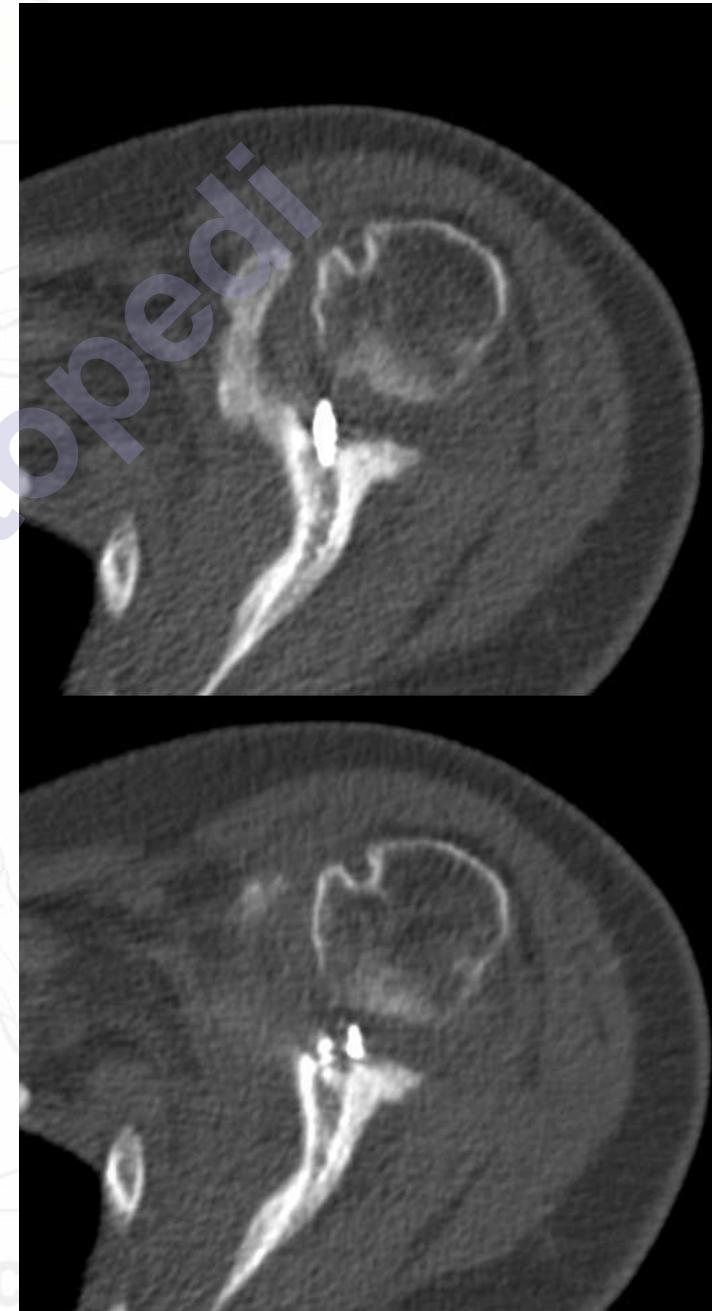


# Implant related complications

- Migration
- Breakage
- Proud implants causing cartilage damage
- Suture tangling
- Enlargement of pilot hole
- Suture loss due to technical error
  - Park HP. Am J Sports Med 2006 34(1):136.



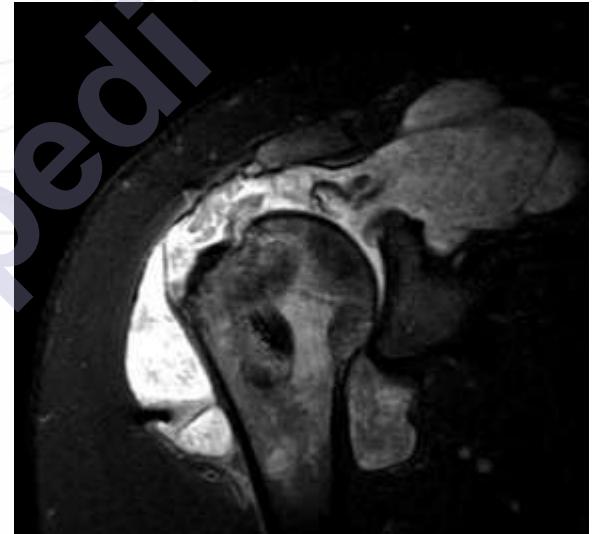
# Failed Bankart repair



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# Bioabsorbable implants

- PLLA anchors
  - Anchor failure
  - Osteolysis
  - Glenohumeral synovitis
  - Chondrolysis
    - McCarty LP. *J Bone Joint Surg Am.* 2013 Mar 20;95(6):507-11.
    - Athwal GS. *J Bone Joint Surg Am* 2006;88:1840-1845.
- Use metal or non-absorbable plastic anchors



Nho SJ. *Arthroscopy* 2009, 25(7):788.

# Prevention

- Careful pre-op evaluation
- Clear operative plan
- Back-up instrumentation and implants
- Surgical dexterity
- Staged rehab goals
- Awareness of unusual complications



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