**secondary pectoralis major reconstruction with auto- or allograft**

**Aim and Background**
- Pectoralis major ruptures are rare injuries.
- Compared to primary surgical therapy secondary reconstruction leads to inferior results.
- Can results of secondary reconstruction be improved by the additional use of auto- or allografts?

**Acute / Chronic**
- Achilles tendon rupture 1 week / 4 weeks
- dist. Biceps tendon rupture 6 weeks / 12 weeks
- Pectoralis maj. / Tendon rupture 5 weeks / 8 weeks
- ACL tear 6 weeks / 6 months
- ant. shoulder instability 2 weeks / 6 months
- AC joint dislocation 3 weeks / 6 weeks

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**chronic Pectoralis major Rupture**
- 2 different Types: Defekt Typ / Scarf Typ

**chronic Pectoralis major Rupture**
- loss of performance up to 50%
- cosmesis
- cramps
- pain

**Clinical key aspect**
- “Contour sign / Shape sign”
  - Loss of contour of the axillary fold in 90°
  - ABDuction > pathognomonic!
**Chronic Pectoralis major Tear**

- **Aim:** restore normal muscle tendon length

![Triceps Strength and Muscle Shortening graph](Hughes_et_al_1997)

**Previous Pectoralis major Tear Study**

- 105 Pectoralis major Ruptures in 92 Patients
- 64 operative Therapy
- 37 primary, postprimary
  - 37 good and very good
  - 32 prior level of strength
- 27 chronic (incl. 5 Recurrents)
  - 12 good, 8 satisfied, 7 poor
  - 12 prior level of strength
- **good results in only 44% of the chronic cases**

![Patient image](Ritch SECEC 2009 2010)

**Methods**

- 300 Pectoralis major tears in 280 patients
- 220 operative reconstructions single surgeon
- 25 Auto or Allografts, 21 Power athletes
- FU 1-3y, ø 36.3y, ø 182 cm, ø 98 kg, ø 16.9y Train.
- **Location:** myotend. junction 21, tendon 3, muscle 1
- **Extent:** compl. 3 x, psc+pab 18 x, psc 1 x, pab 3 x
- **Cause:** Bench pressing 13x, Fall 7x, Wrestling 3x
- **Time to OP ø 39 month (4 month-18 years)**

![Augmentation](Augmentation)

**Results**

- 23/25 Patients (92%) good and very good results
- 2 Satisfied (Bak Classification - Bak et al. 2000)
- **Return to sport 100%**
- **Return to prior performance 80%**
- complication rate 24%
- minor complications 16%
  - wound healing disorders
- major complications 8%
  - 1 deep infection (Autograft), 1 deep arm thrombosis
- problems with the lifting defect of the Autografts in athletes
**Chronic Pectoralis major Rupture**

- Defect Type
  - Mobilisation of the ruptured tissue and refixation to the humerus, if possible. In most cases a tendon graft Interposition or Augmentation is needed.

- Fascia scarf Type
  - Mobilisation of the scarf tissue and refixation to the humerus. There in normally no tendon graft needed.

**Conclusion**

- early, acute operation achieve the best results
- avoid chronic cases
- Refixation in chronic cases not always needed
- high complication rate, additional Autograft
- difficult soft tissue surgery, needs experience
- good mobilisation of the Pect. major muscle and suture anchor refixation is needed
- Hamstring Allograft is a good alternative to Autograft
- the Hamstring lifting defect in power athletes is much smaller when taking gracilis tendon

**Conclusion**

- 2 different types in chronic cases
- secondary pectoralis major reconstruction in chronic defect type cases with Auto or Allograft achieve good results
- in contrast to a previous study with direct repair the results with graft are better 92% vs 44% good
- no differences regarding the different parts of pectoralis major. Maybe the pars sternalis is more difficult to reconstruct.
- no differences in outcome between Allo- and Autograft reconstruction
- High complication rate in this series

"Keep the focus on the patient"

Matsen III 2014