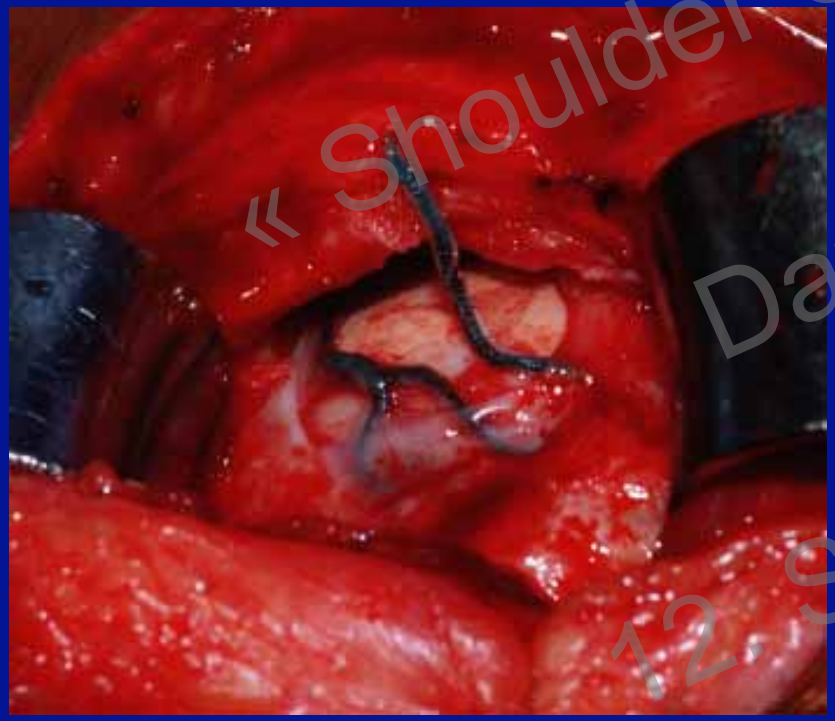
ROTATOR CUFF REPAIR

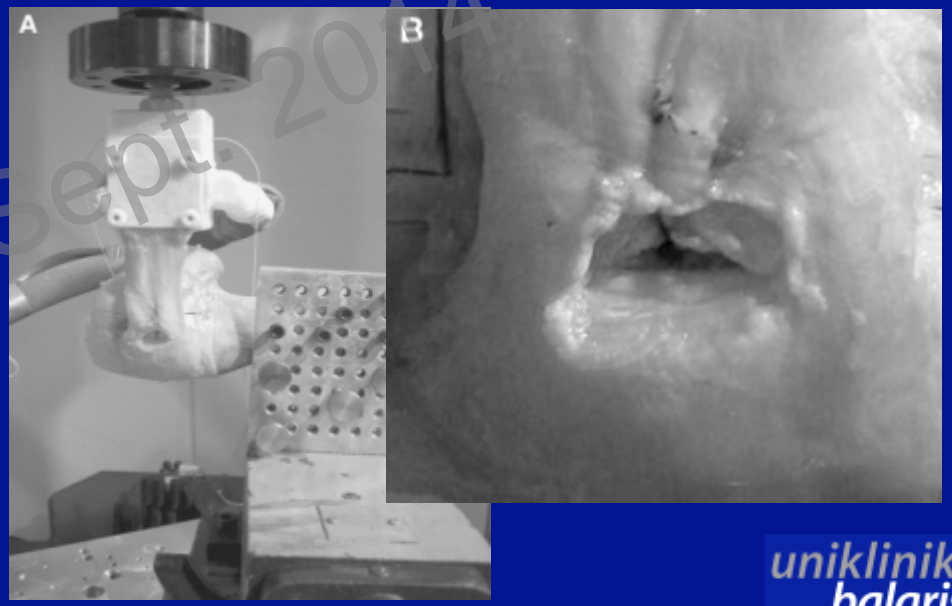


Clinical outcome
significantly better
without rerupture

Gerber et al,
JBJS 82-A, 505, 2000

HEALING

- If the gap at the time of repair is >3mm in dog flexor tendons, then the repair will fail to gain strength with healing.
- In experimental RC-repair, 5mm gap may be considered critical



Gelberman R, JBJS Am 81; 975, 1999

Koganti A, AJSM, 2006

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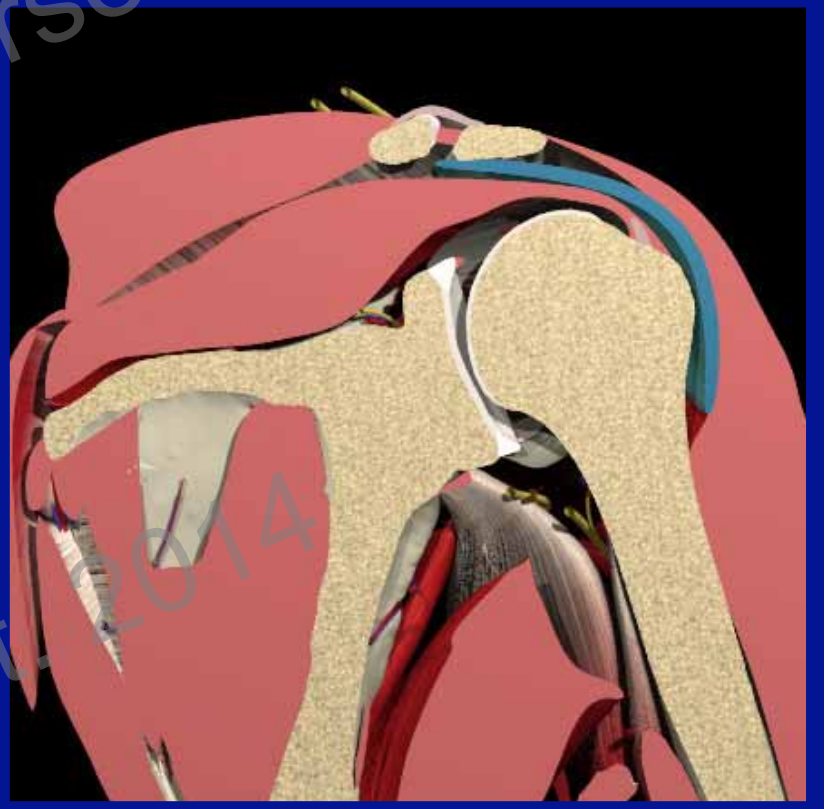
ELEMENTS LOAD CHAIN OF RC-REPAIR

1. Muscle
2. Tendon
3. Suture and stitch
4. Bone (humerus)

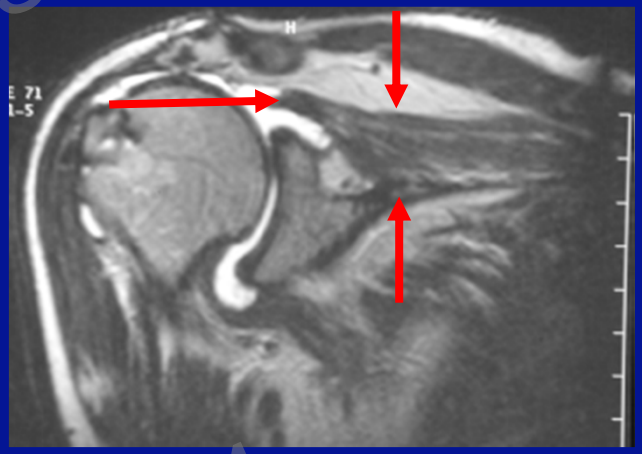


Any repair is only as strong as the weakest link in the load chain

MUSCLE

Radiological sequelae of tendon tear:

- Myotendinous retraction
- Atrophy
- Fatty “degeneration”



MUSCLE

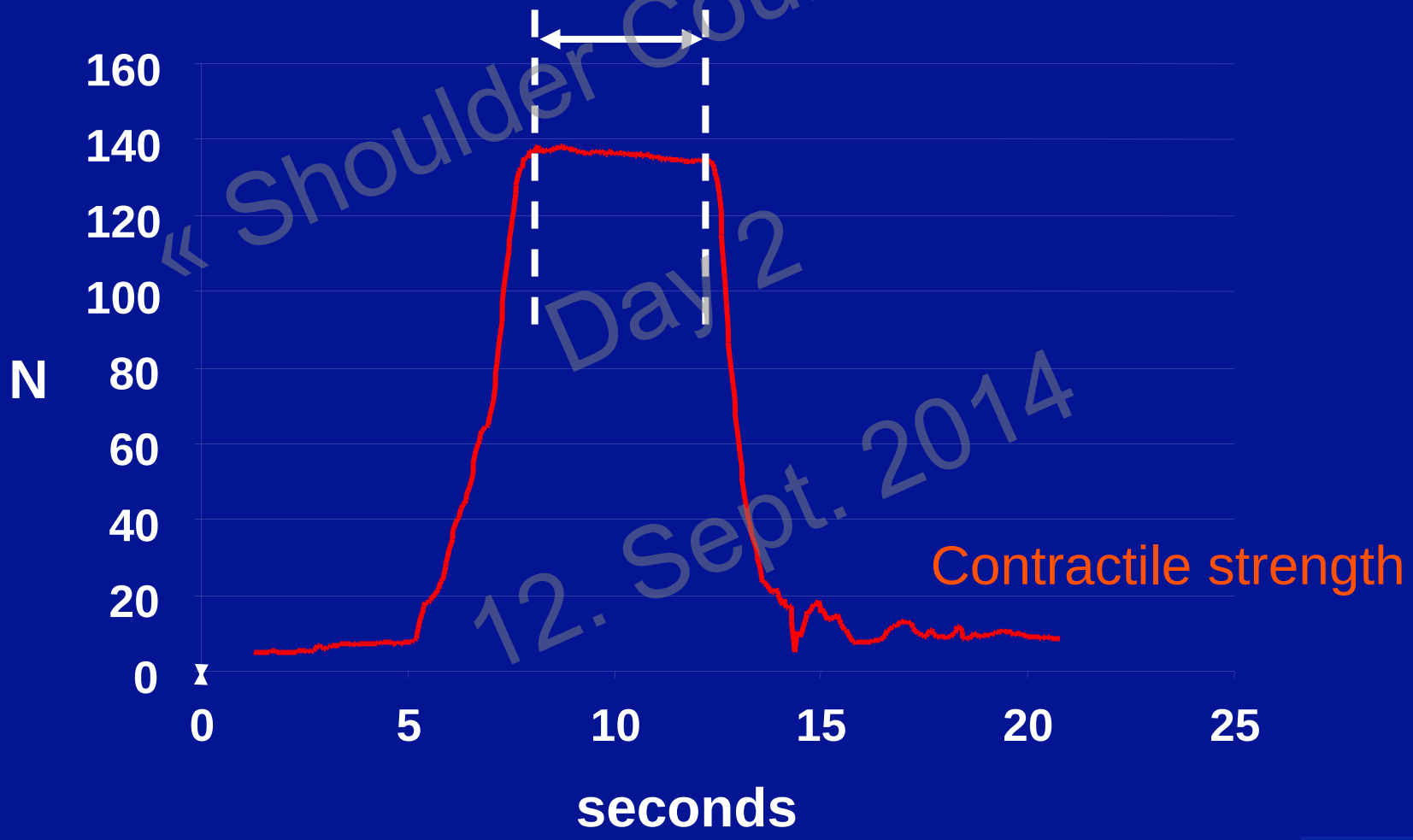
Tension measurement device*

Stimulation

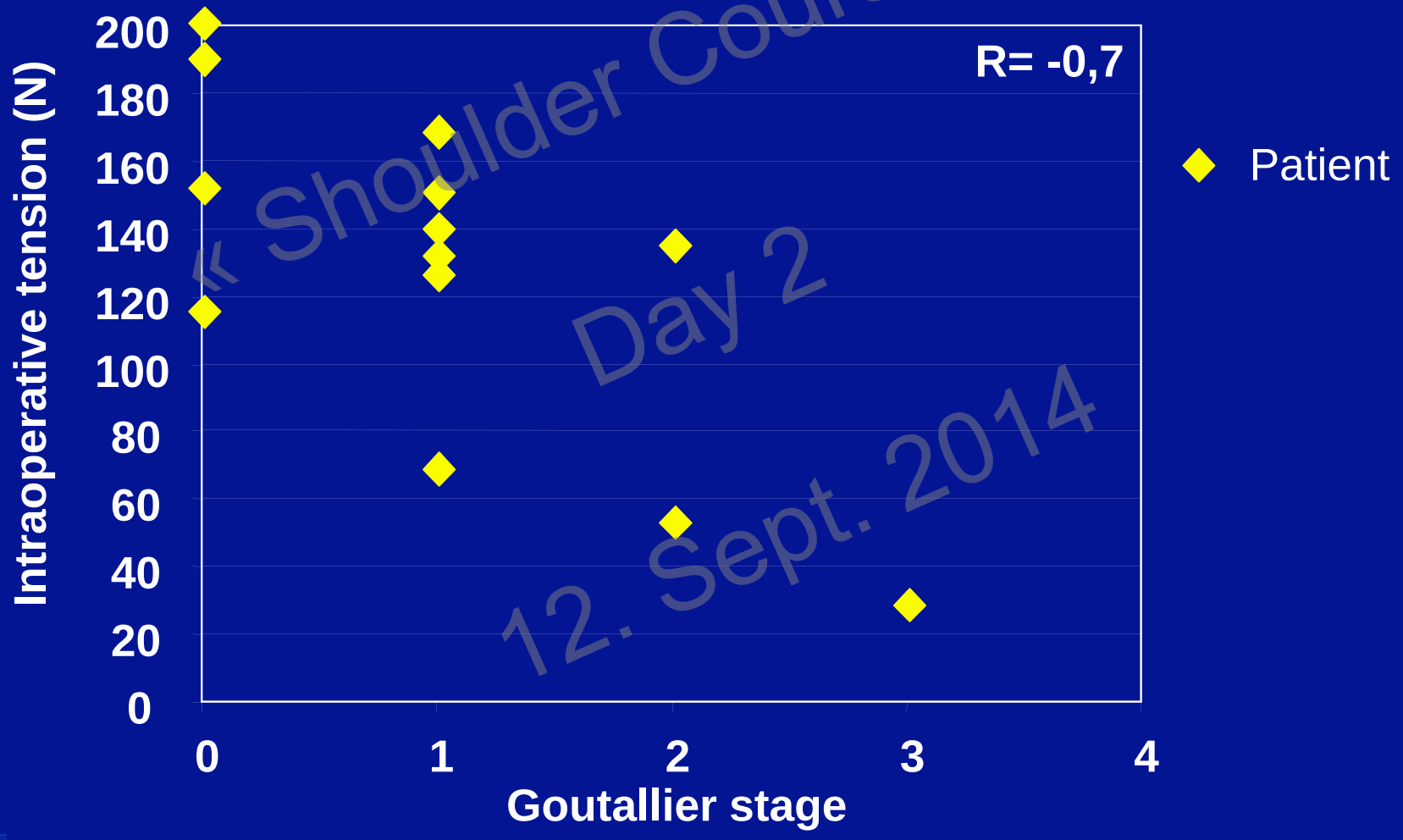
suprascapular nerve

*Hersche O, JSES 1998;7 393-6

MUSCLE



INTRAOPERATIVE TENSION VERSUS GOUTALLIER STAGES



Gerber C, Meyer DC, 2008. JSES

EXTRAPOLATION

		Goutallier	
	area RC*	0	2
m. supraspinatus	16%	166 N	97 N
m. infraspinatus	38%	*395 N*	*231 N*
m. subscapularis	46%	*477 N*	*280 N*

Gerber C, Meyer DC, 2008. JSES

*Bassett, J Biomech; 1990: 415

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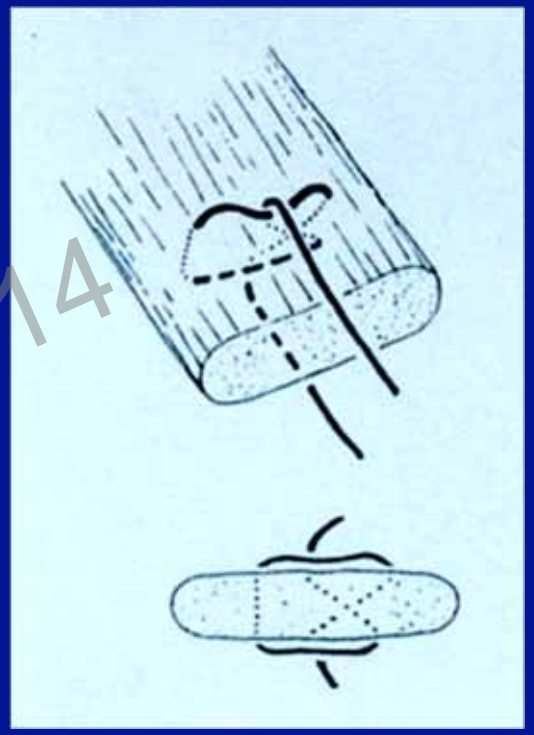
BEST TENDON STITCH IN-VITRO

Gerber C, JBJS; 1994, 76B,371-80

BEST TENDON STITCH IN-VITRO

Modified Mason-Allen stitch:

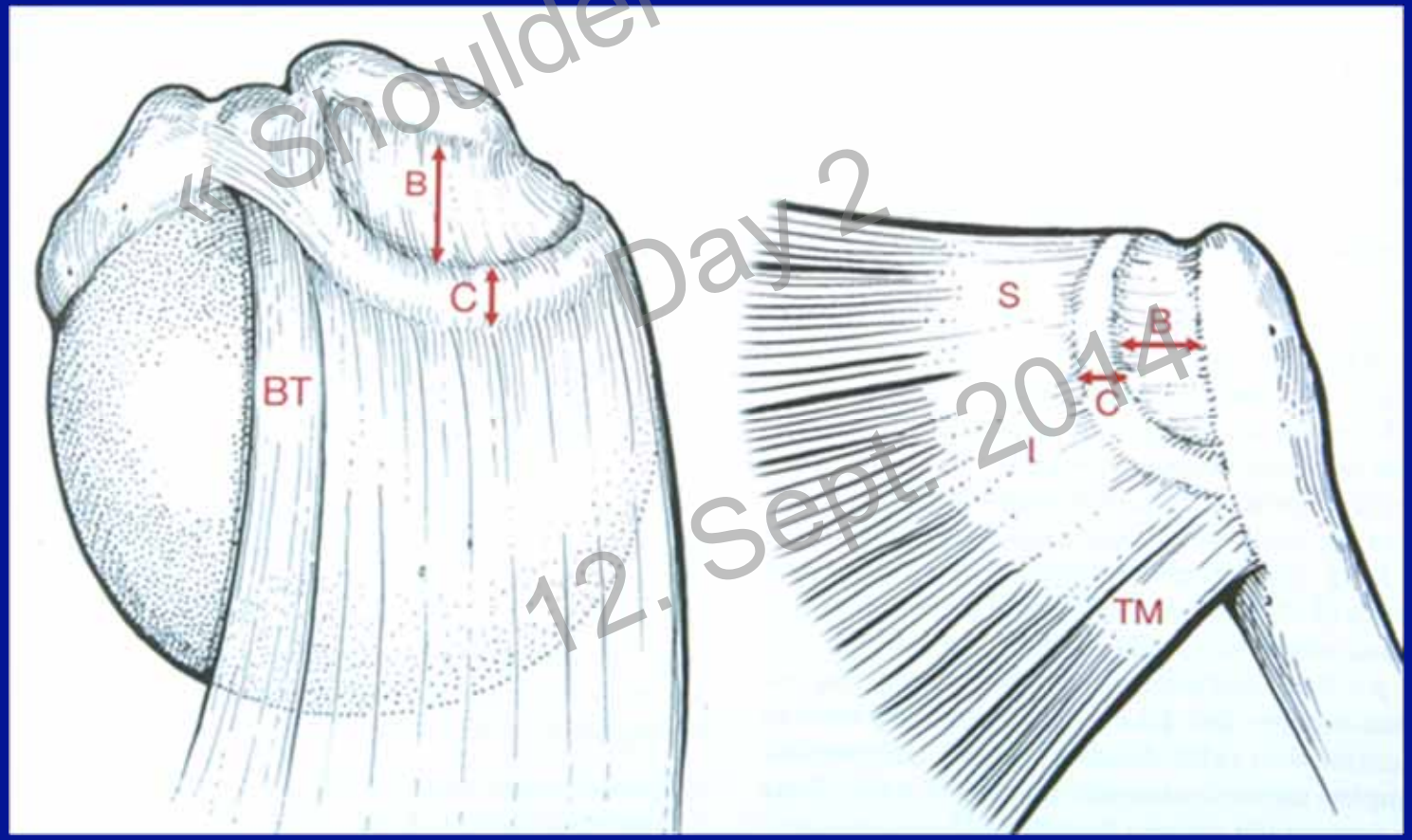
- requires little tendon substance
- best resistance to cyclic load
- least gap formation
- still slides



Gerber C, JBJS ;1994, 76B,371-80

BEST POSITION OF THE TENDON STITCH

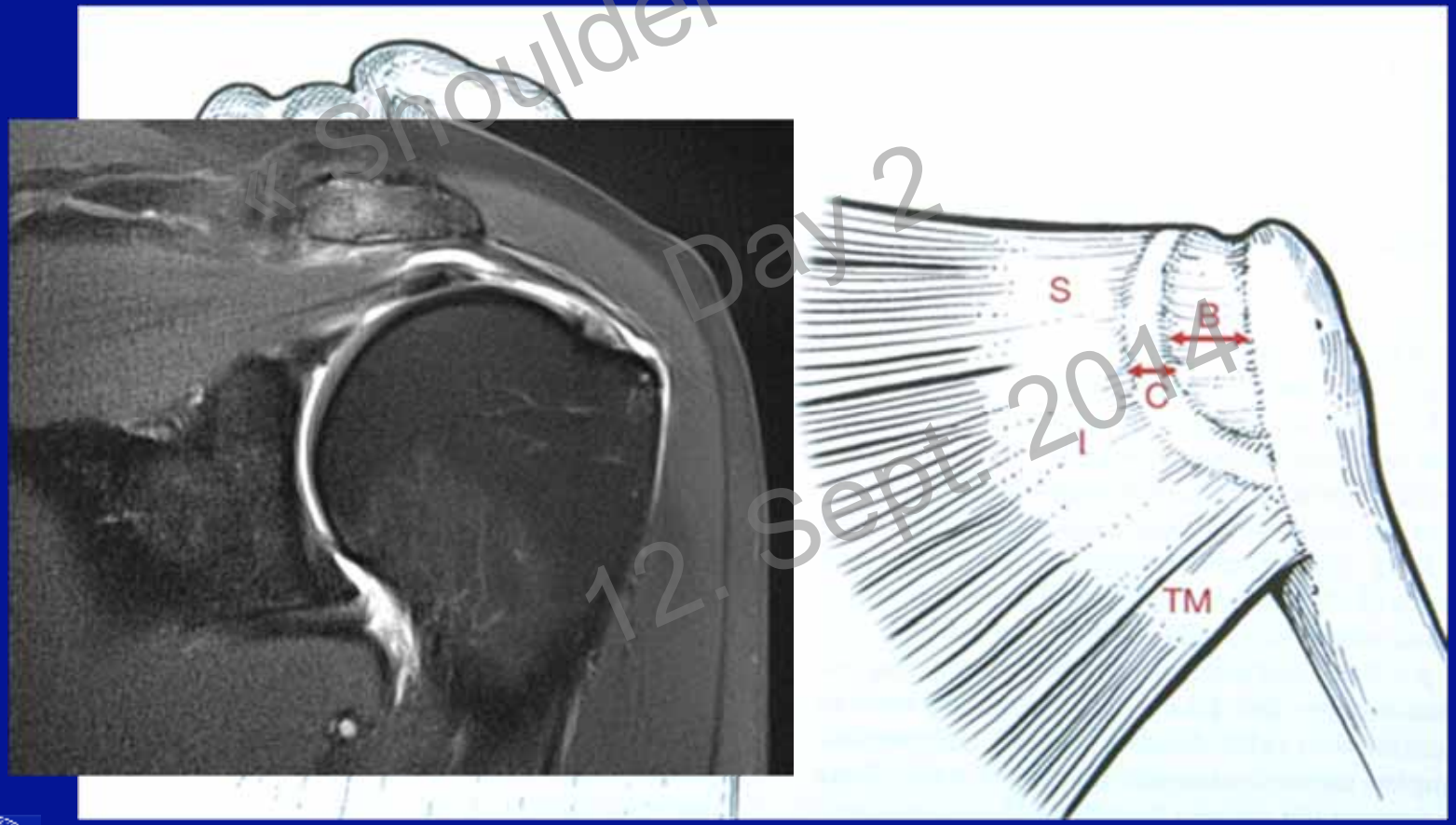
Human rotator cuff: Rotator cable



drawing from: Burkhart et al

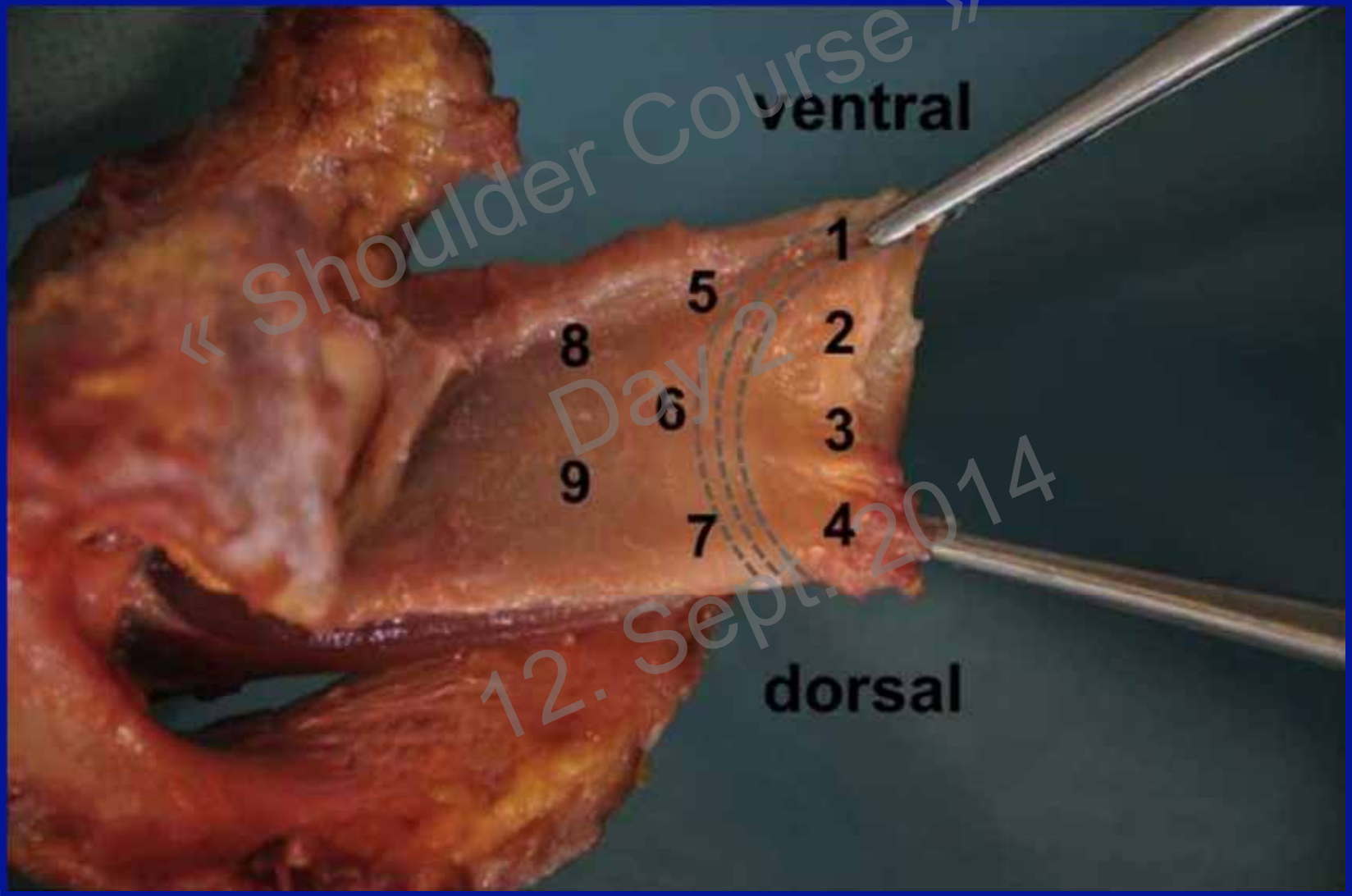
BEST POSITION OF THE TENDON STITCH

Human rotator cuff: Rotator cable



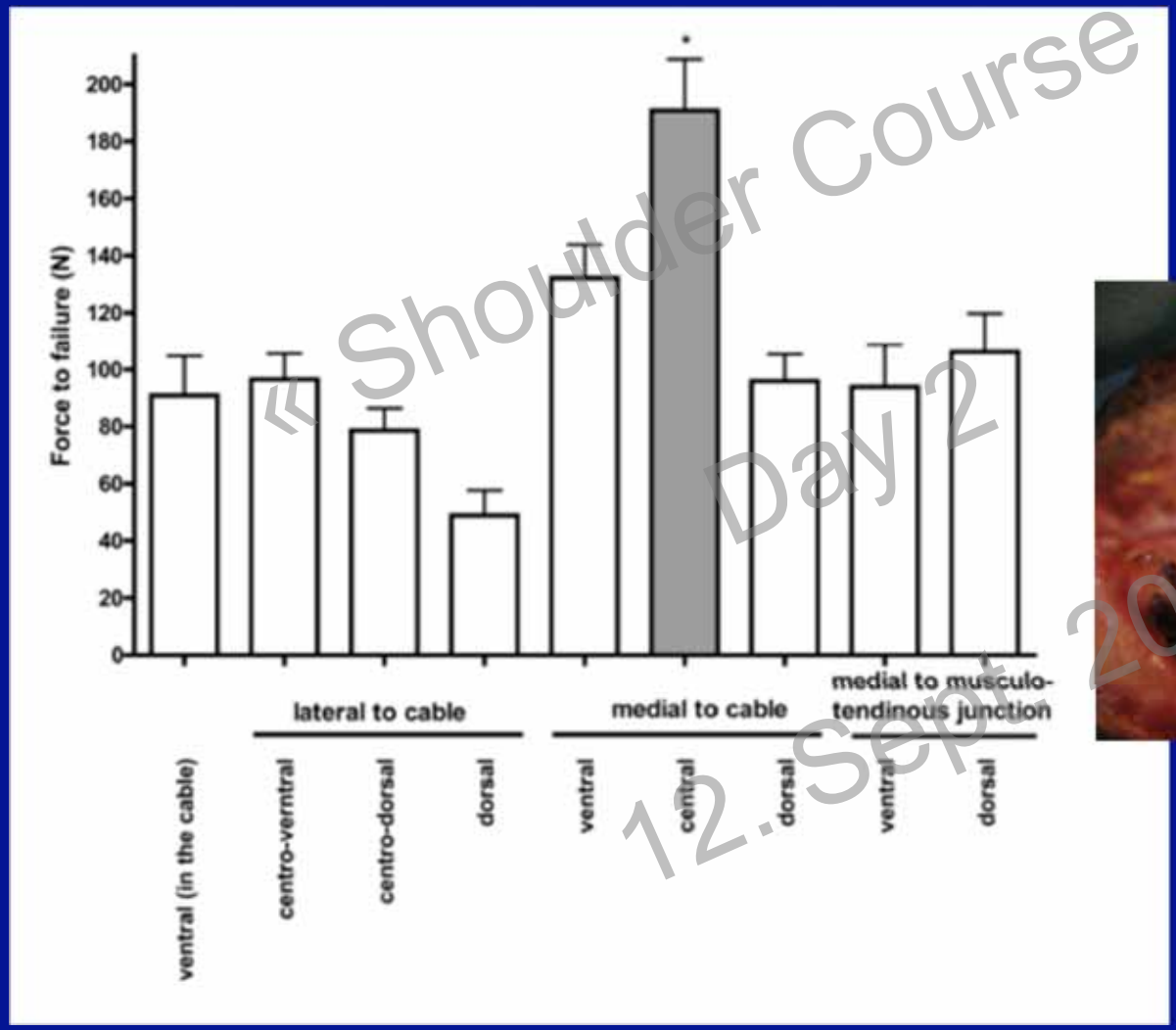
drawing from: Burkhart et al

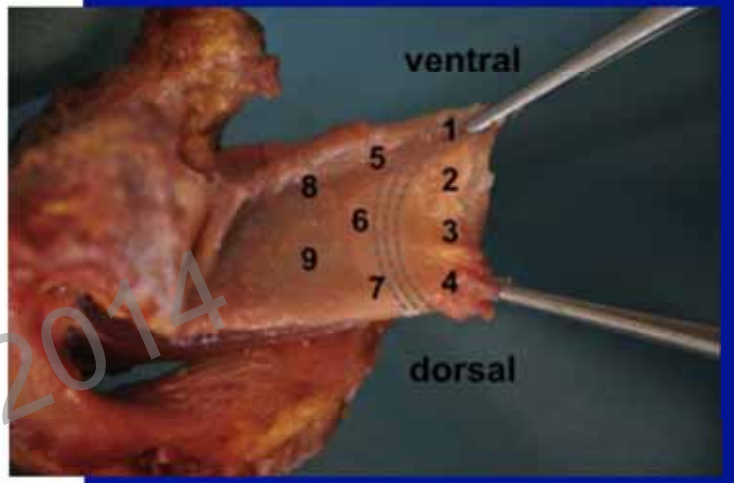
BEST POSITION OF THE TENDON STITCH



Wieser K, JSES 2013

BEST POSITION OF THE TENDON STITCH





Wieser K, JSES 2013

MUSCLE VS. TENDON STITCH

	Goutallier	
	0	2
m. supraspinatus	166 N	97 N
m. infraspinatus	*395 N*	*231 N*
m. subscapularis	*477 N*	*280 N*

Open repair 2x Ethibond 3 : **329 N***

Arthroscopic repair 2x Ethibond 2: **228 N****

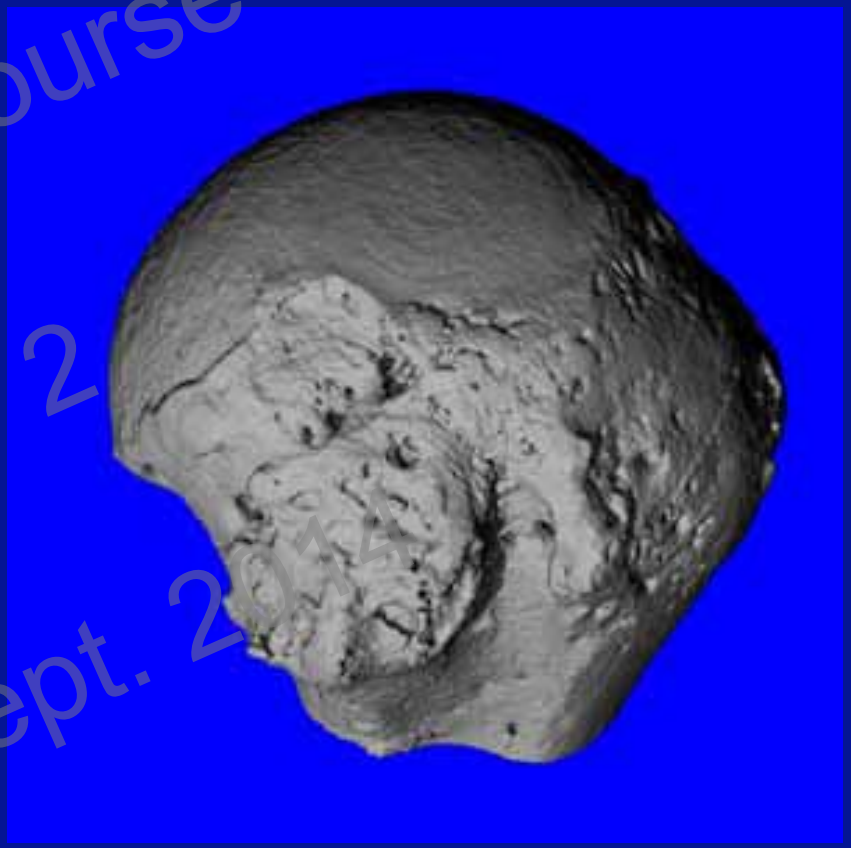
*Gerber, JBJS 81-A, 1999

**Schneeberger, JBJS 2003

MORE DANGER ?

BONE

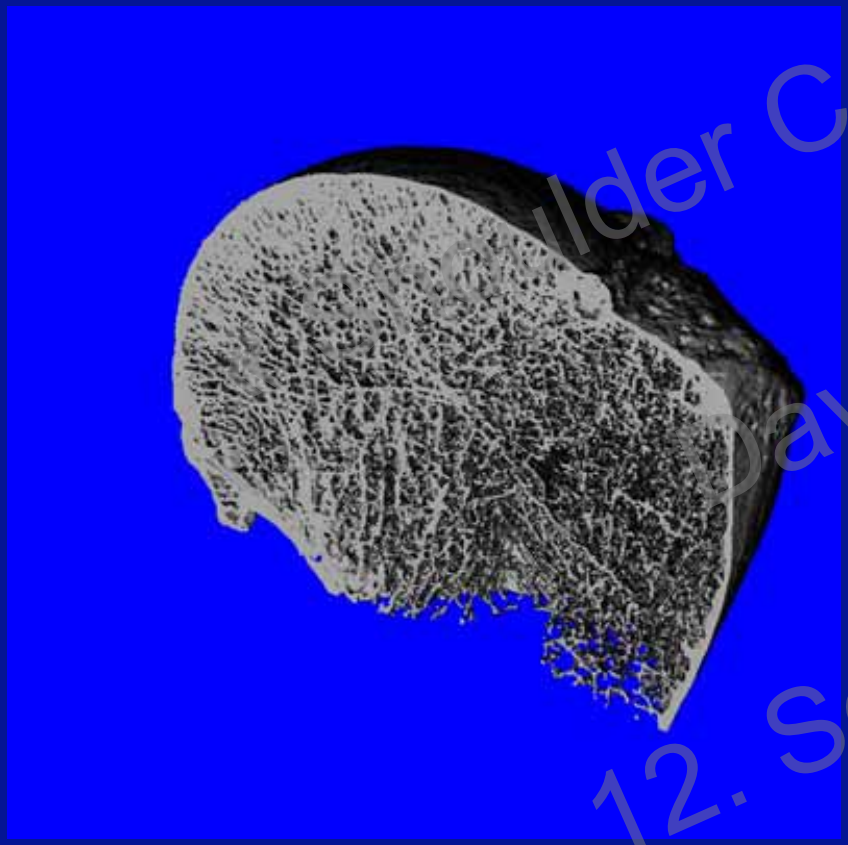
Intact tendon

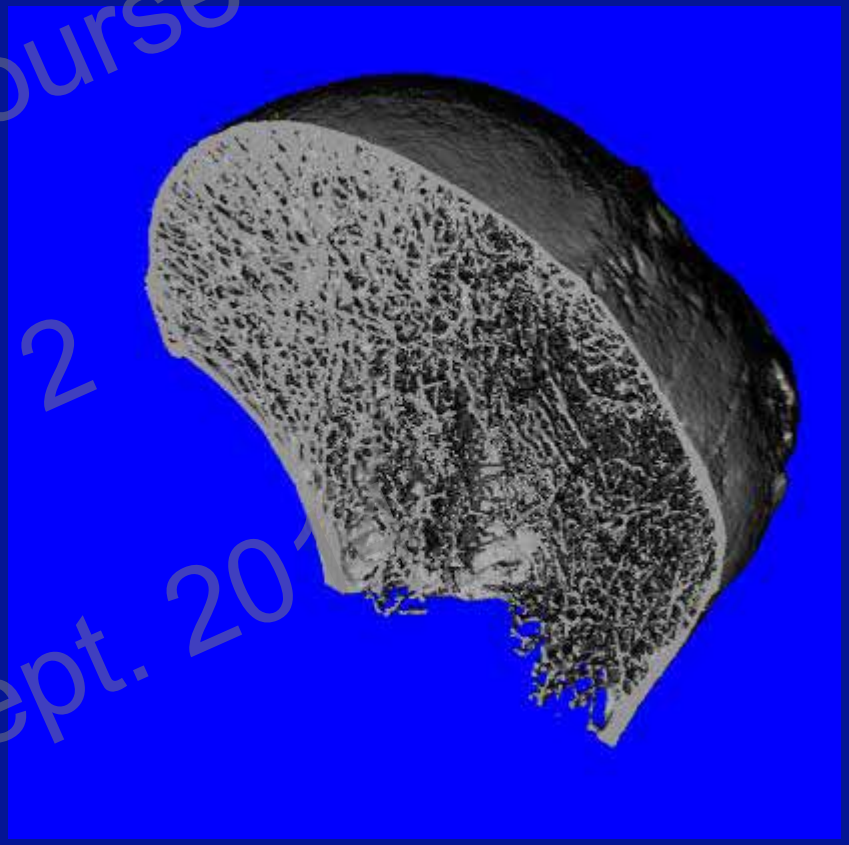


Ruptured tendon

Meyer DC, JSES 2004, 333

BONE

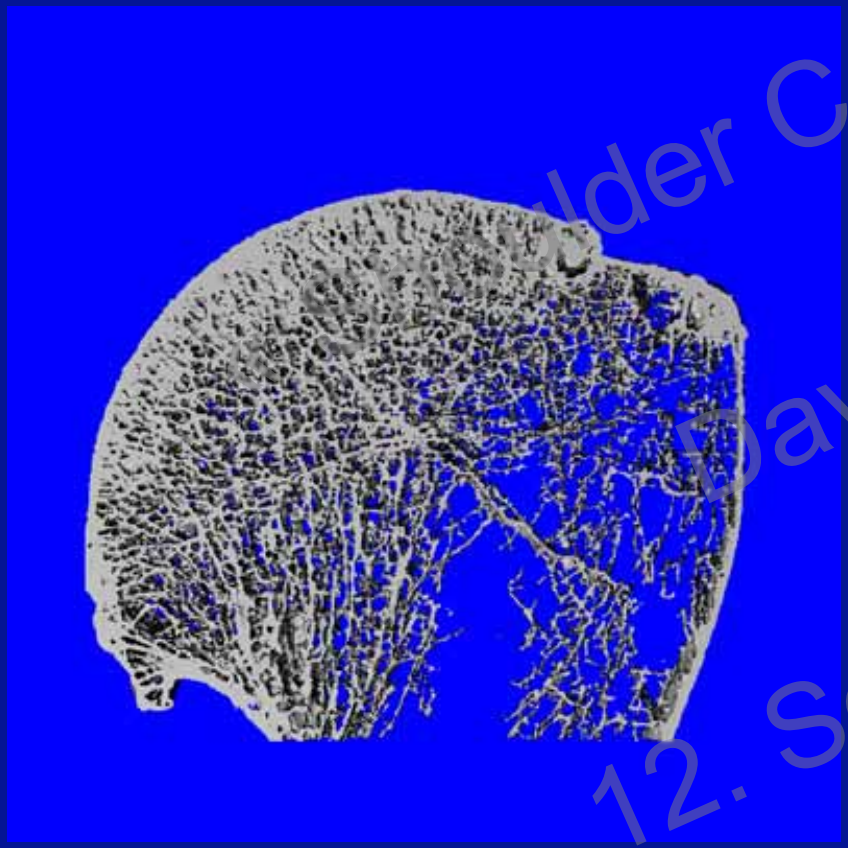




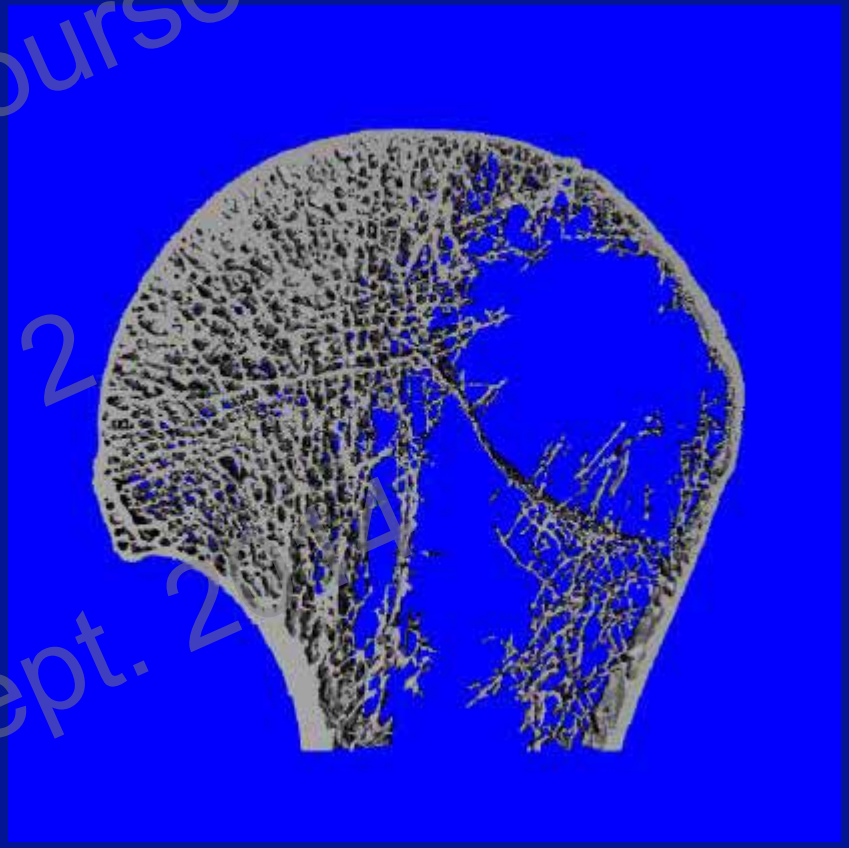
Intact tendon **Ruptured tendon**

Meyer DC, JSES 2004, 333

BONE



Intact tendon



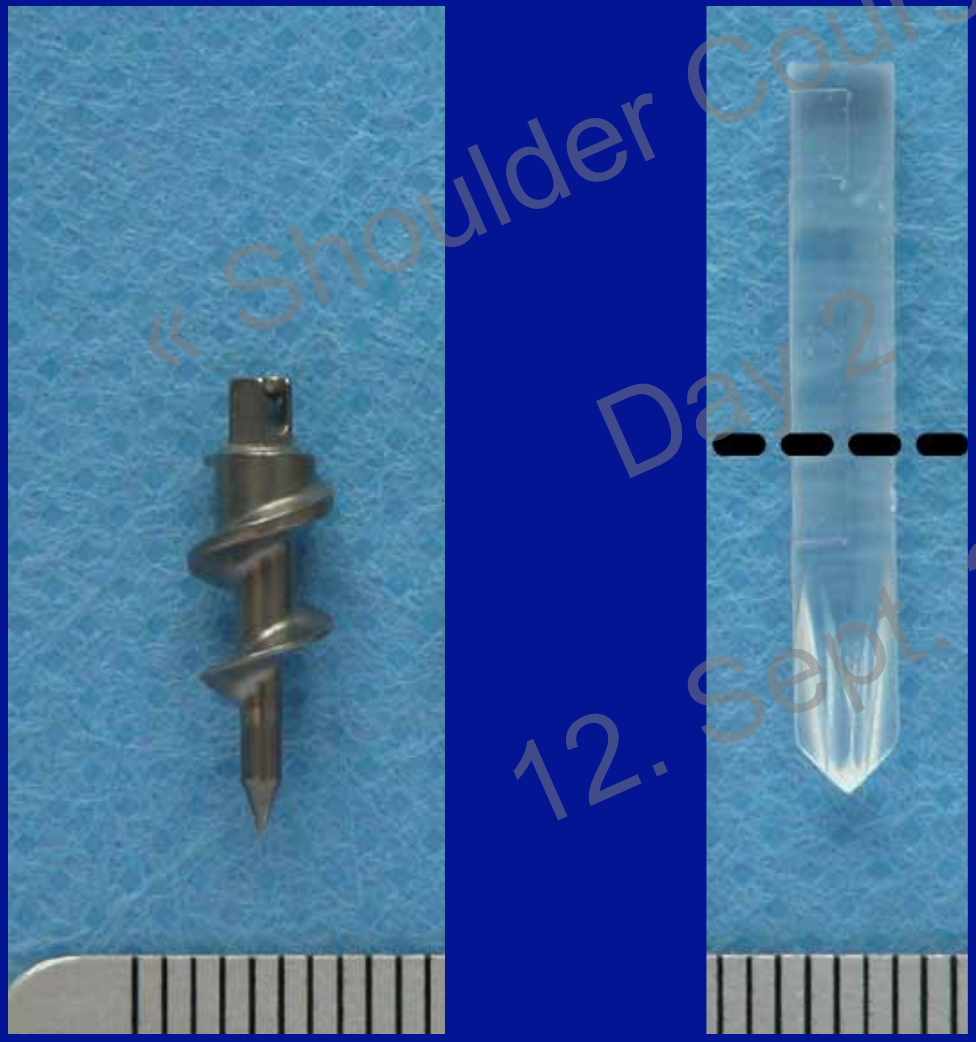
Ruptured tendon

Meyer DC, JSES 2004, 333

ANCHOR IN BONE

ANCHOR IN BONE

ANCHOR PULLOUT-STRENGTH VS BONE DENSITY

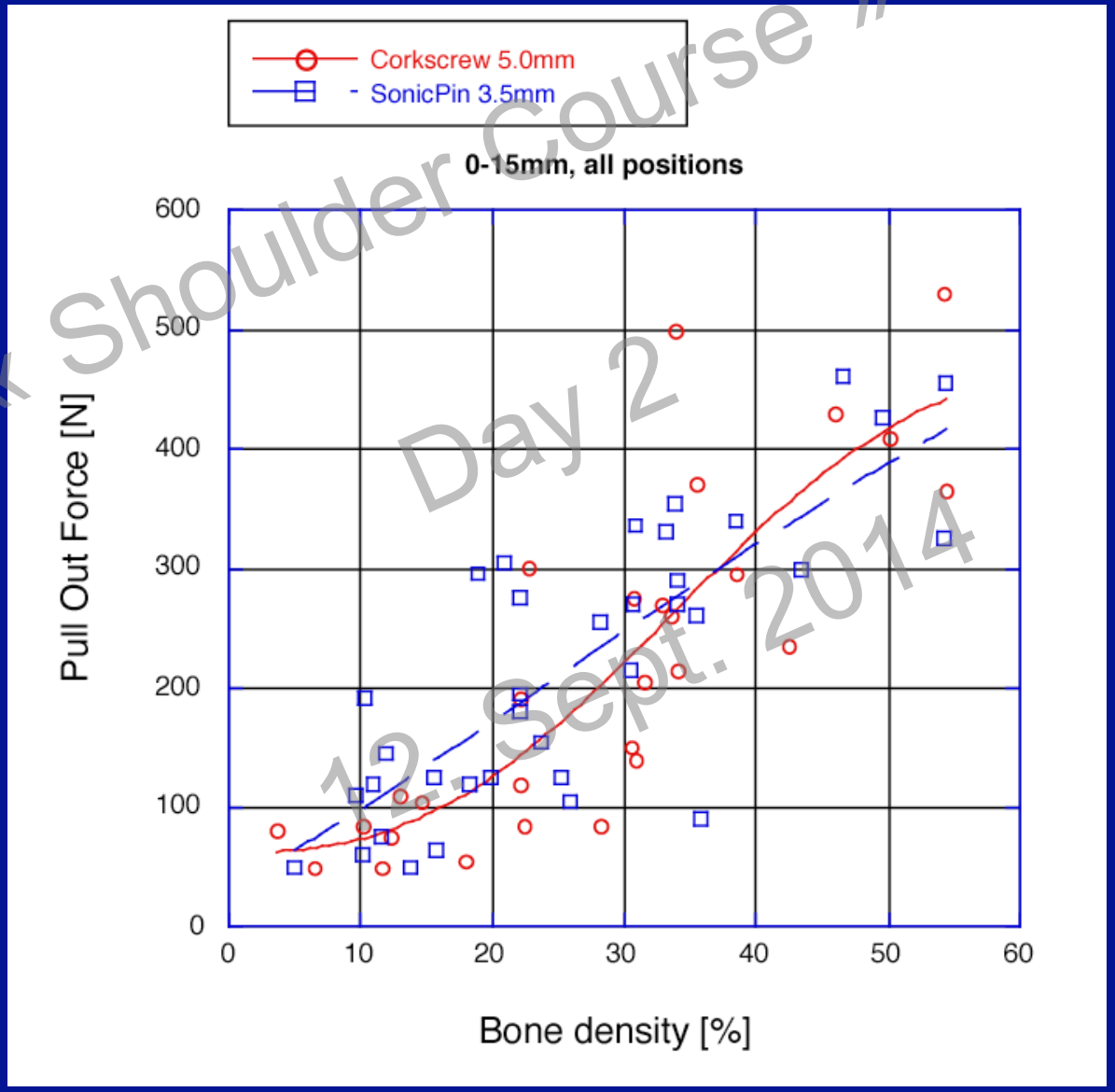


Meyer DC, CORR, 2006;442:143

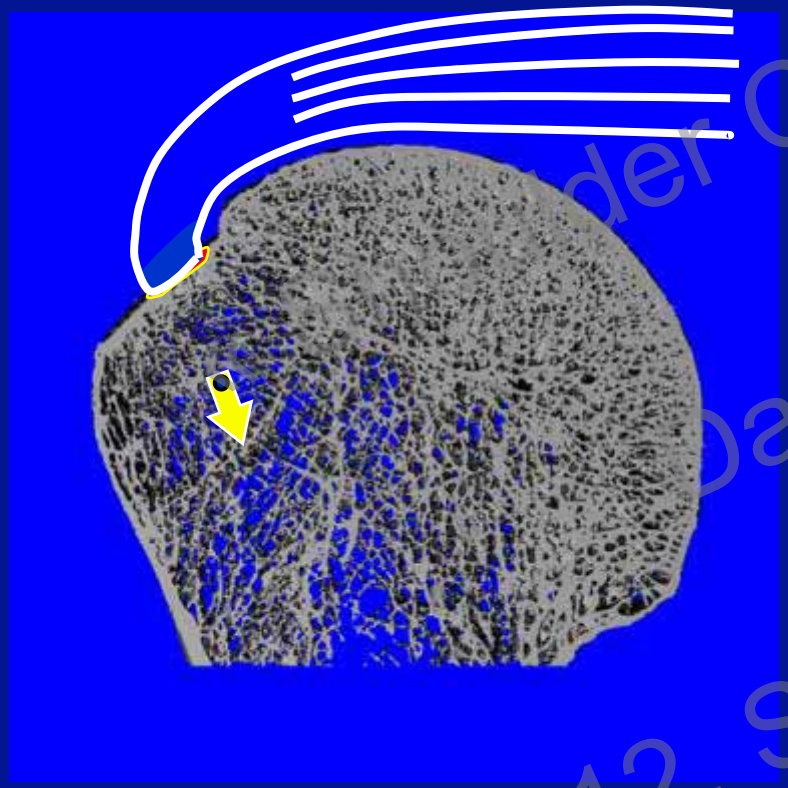
ANCHOR PULLOUT-STRENGTH VS BONE DENSITY

Meyer DC, CORR, 2006;442:143

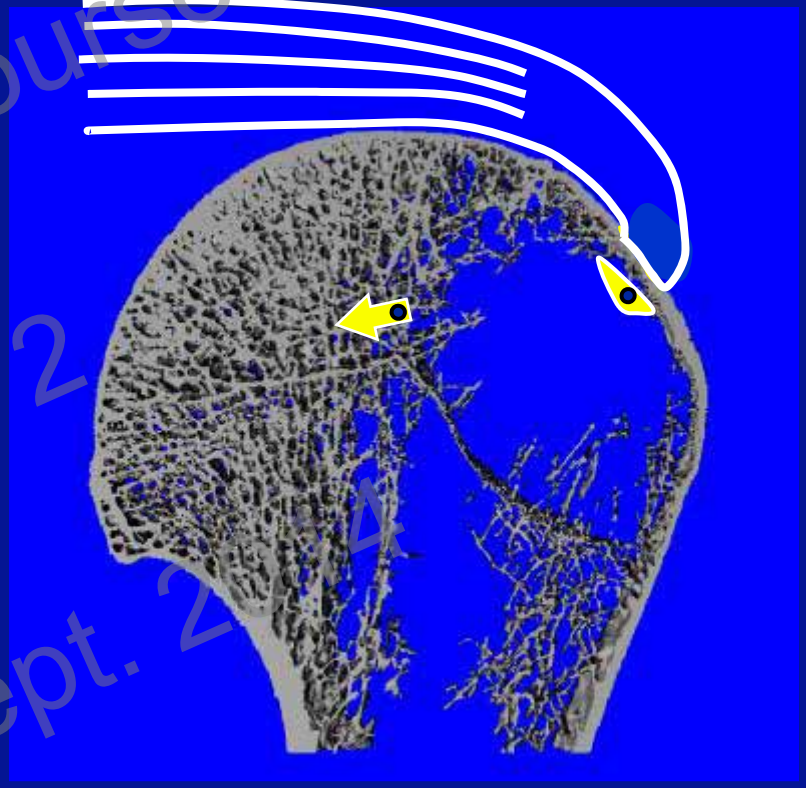
ANCHOR PULLOUT-STRENGTH VS BONE DENSITY



BONE



Recent tendon tear

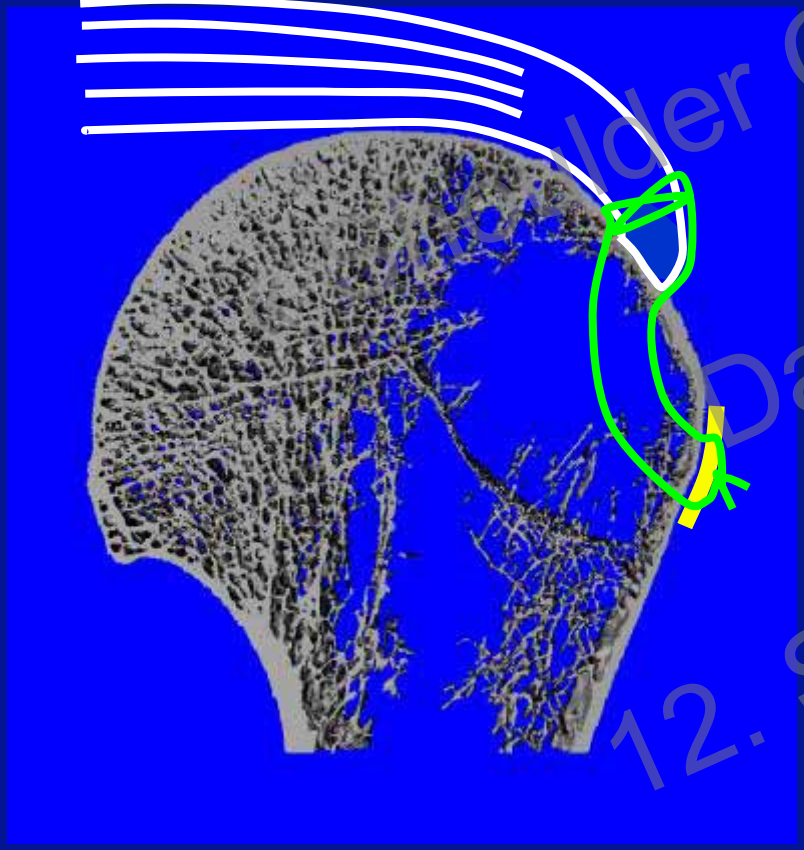


Chronic tendon tear

TRANSOSSEOUS FIXATION

Gerber C, JBJS ;1994, 76B,371-80

TRANSOSSEOUS FIXATION



Gerber C, JBJS ;1994, 76B,371-80

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KNOTS IN FIBERWIRE

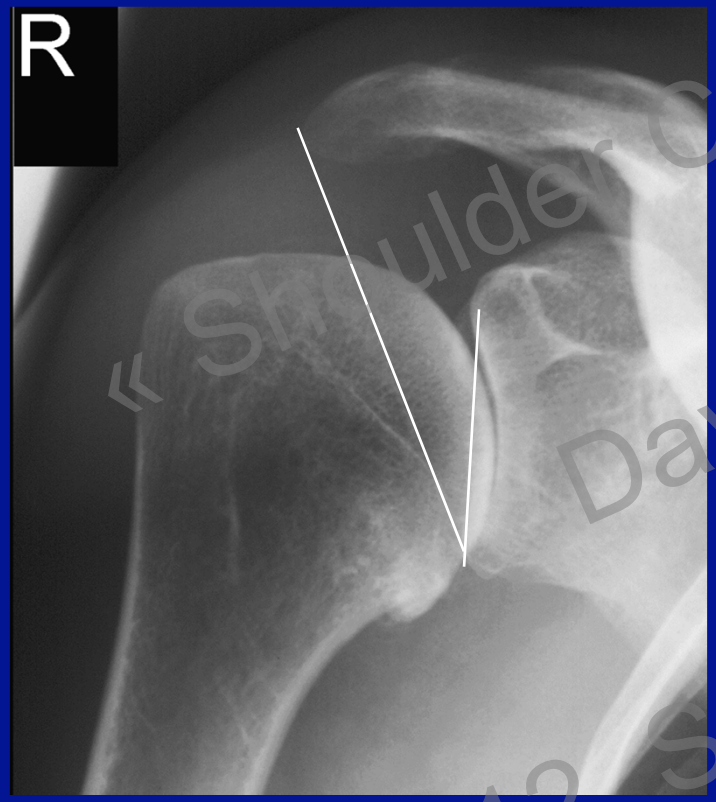
KNOTS IN FIBERWIRE

CONCLUSION

Any repair will only be as strong as the weakest link.

No current repair technique is strong enough to resist repetitive action of the rotator cuff musculature.

CRITICAL SHOULDER ANGLE: NORMAL 33±2.1°



OA: 28± 3.3°

rct: 38±2.7°

Moor, B, JBJS 2013

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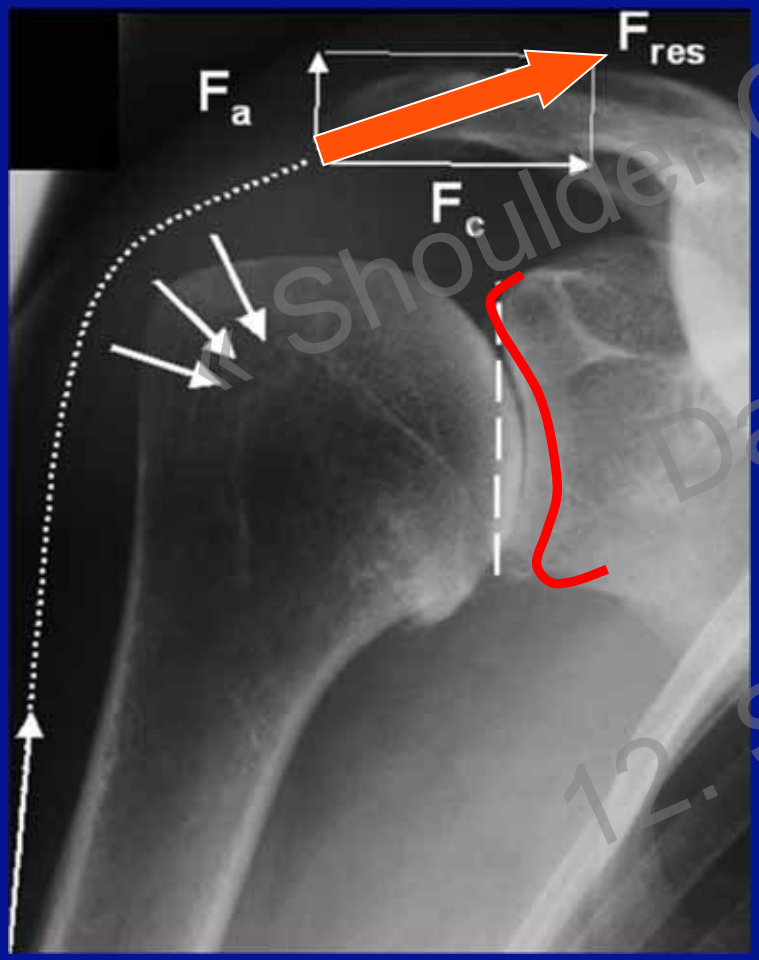
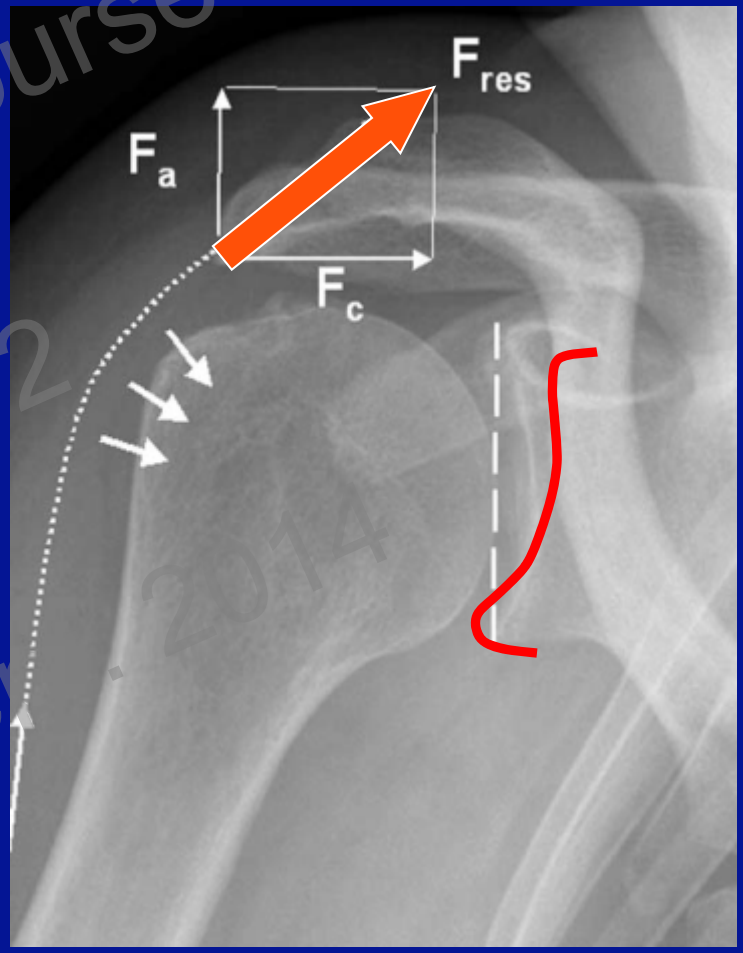
HYPOTHESIS





Nyffeler; JBJS Am 88(4):800-5, 2006

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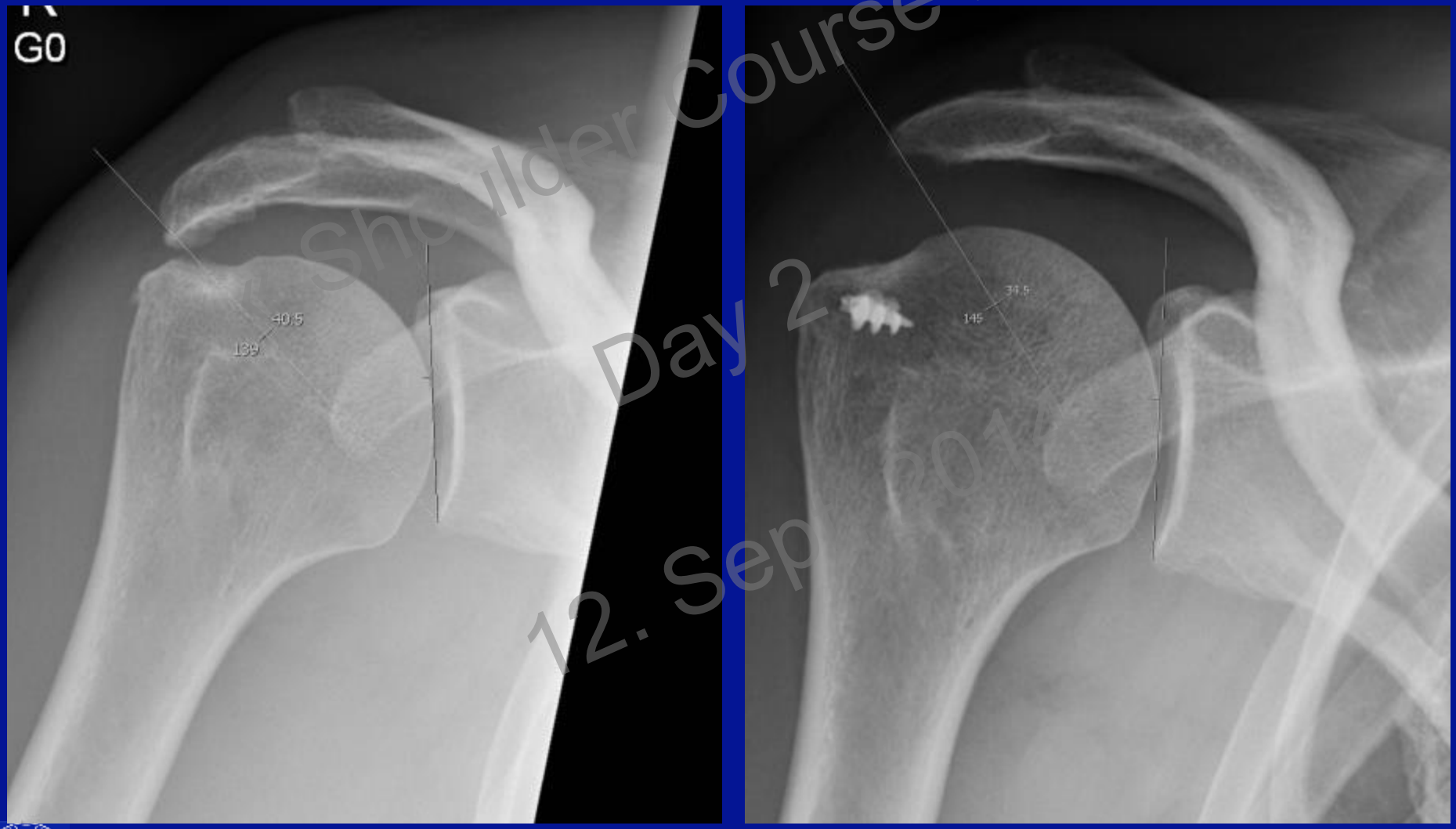
CLASSIFICATION

CSA (N=298)		Control	Osteoarthritis	Rotator cuff tear
1 ° : <30 °	(N=82)	3.6%	95.2%	1.2%
2 ° : 30 ° to 35 °	(N=114)	71.8%	18.2%	10.0%
3 ° : >35 °	(N=92)	11.4%	2.9%	85.7%

FUTURE PERSPECTIVE



CONCLUSION

Primary OA is associated with significantly smaller and degenerative RCTs with significantly larger CSAs than normal, asymptomatic shoulders.


« Short Course »
Day 2
12. Sept. 2014

« Shoulder Course »

Day 2

12. Sept. 2014

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