# "Use of Stemless Implants for Treatment of Glenohumeral Arthritis"

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# Disclosures!

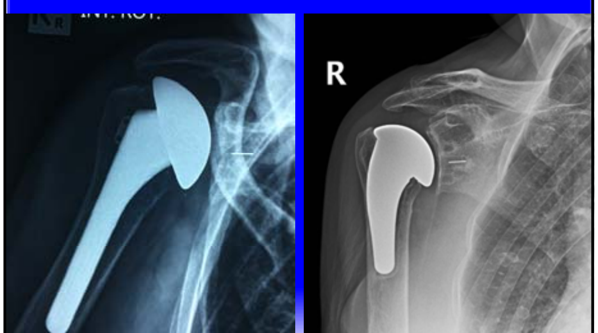
None


## This is what we hope to achieve with a Stemless TSA!

# History

- Stemmed (1970's +)
- Eccentric Heads (1990's)
- Resurfacing (Early 2000's)
- Short stem (Last 10 to 12 years)
- Stemless (Last 8 to 10 years)

## Standard Stem to Short Stem




## Resurfacing to Stemless

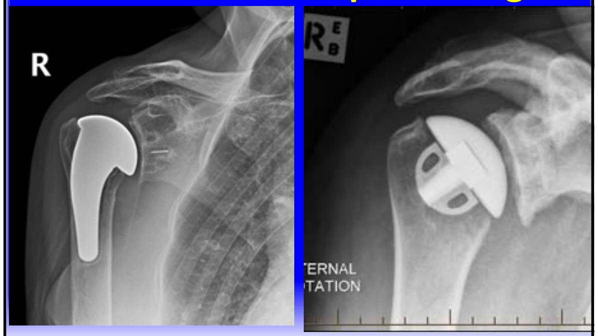
## Why have we changed?

- We are always trying to create a shoulder that is as close to anatomical as possible!
- We have always known that it is extremely rare for the humeral component to get loose.
- For this reason we have pushed the boundaries to a stemless prosthesis!

## Advantages of a Stemless Shoulder!

- preserved bone stock,
- less stress shielding?
- eliminating the diaphyseal stress riser,
- ease of stem removal at revision,
- humeral head placement independent from the humeral shaft axis!

## Stemless – can be anatomic and More Bone preserving



# Stemless Literature

- The results are very similar to standard TSA's
- There has not been a higher rate of revisions
- Humeral loosening/ subsidence has not been a problem

Churchill SR, Athwal GS. Stemless shoulder arthroplasty – current results and designs. Curr Rev Musculoskeletal Med (2016) 9:10-16.

Petricciolli D et al. Stemless shoulder arthroplasty: a literature review. Joints. 2015 Jan-Mar; 3(1):38-41.

**Table 1** Comparison of stemless arthroplasty reports with 2-year minimum results

| Author | Implant | Number of patients | Years of minimum follow-up | Hemi or total arthroplasty | Constant score | Forward elevation | External rot |
|---|---|---|---|---|---|---|---|
| Huguet et al. | TESS | 63 | 3 | Both | 75 | 145° | 40° |
| Berth and Pap | TESS | 41 | 2 | Total | 65 | NR | 54° |
| Churchill et al. | Simpliciti | 149 | 2 | Total | 81 | 147° | 56° |
| Habermeyer et al. | Eclipse | 78 | 5 | Both | 75 | 140° | 44° |

**Table 2** Key features of stemless arthroplasty implants

| | Arthrex | Biomet Zimmer | | | FX Solutions | Lima | Matheys | Wright Medical |
|---|---|---|---|---|---|---|---|---|
| | Eclipse | TESS | Nano | Sidus | Easytech | SMR Stemless | Affinis Short | Simpliciti |
| Introduced | 2005 | 2004 | 2013 | 2012 | 2015 | 2015 | 2008 | 2010 |
| FDA approval | No | No | No | No | No | No | No | Yes |
| 2-year minimum follow-up report | Yes | Yes | No | No | No | No | No | Yes |
| Fixation | Screw In | Impaction | Impaction | Impaction | Impaction | Impaction | Impaction | Impaction |
| Collar type | Solid | None | None | Open | Open | None | None | Solid |
| Bone contact area | High | High | High | Low | Low | High | Low | High |
| Morse taper | Male | Male | Female | Male | Female | Female | Male | Female |
| Component pieces | 3 | 3 | 2 | 2 | 3 | 4 | 2 | 2 |
| Convertible | No | No | Yes | No | No | Yes | No | No |

**Churchill RS et al. Clinical and Radiographic Outcomes of the Simpliciti Canal-Sparing Shoulder Arthroplasty System: A Prospective Two-Year Multicenter Study. J Bone Joint Surg Am. 2016 Apr 6;98(7):552-60.**

- 157 Patients, 14 sites , 5% drop out
- Constant score, ROM improved, Pain decreased
- 3 postoperative complications causing revision surgery: infection, glenoid loosening, and failure of a subscapularis.
- No evidence of migration, subsidence, osteolysis, or loosening of the humeral components

## "International Journal of Shoulder Surgery" Bell, Coghlan 2015

- Short Stem Affinis Shoulder Replacement
- 97 cases,ASES, SPADI and Constant scores increased
- 2 year follow up
- 98% satisfaction
- No radiolucent lines
- No complications

# Why I Use Stemless Shoulder Replacements Over Short Stem Replacements?

## Reasons I Changed

- Arm pain – similar to thigh pain
- More anatomic
- Decrease Humeral shaft fracture
- Bone preserving
- Easier Revision surgery

## My Series

- 145 cases in 5 years
- My first stemless was Nov 2011
- Was selective in who had a stemless for 2 years- now everyone gets one for a TSA

## Surgical Technique

- No significant difference to a standard TSA apart from the accuracy and position of your humeral cut and the importance of a solid subscapularis repair

## Things to get right on the humerus

- Replace anatomically what you remove
- Don't overstuff
- Always go smaller if unsure
- Don't leave inferior osteophytes

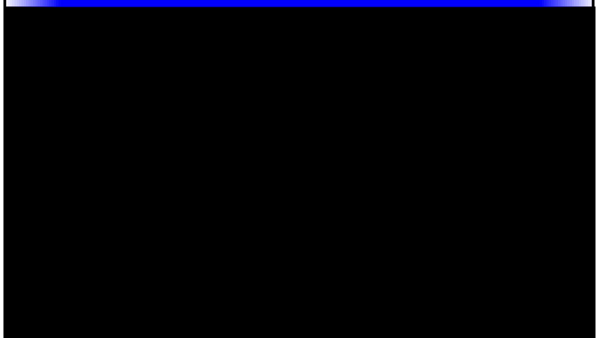
## Importance of the Humeral cut

To horizontal

Perfect

## Things to get right on the humerus

- Check for full ROM without any impingement inferiorly
- Don't be concerned about posteriorly subluxation on the table especially when the subscap is not attached



2 days post
stemless TSA

## Who Can we perform a stemless on?

- I used to believe only in young males but NOW I really believe it can be done in anyone as long as the cuff is intact and good quality
- Occasionally the fixation can feel slightly inferior in osteoporotic bone BUT I haven't found any subside or collapse

## Results in my Cases

- Radiographs 1, 2 and 5 years, 10 years
- Clinical exam
- Constant and SPADI scores
- Complications documented
- Comparisons made to stemmed TSA's

## Outcome Simpliciti 2 years plus

- I can only really comment on the Tornier Simpliciti Stemless TSA
- No clinical or radiological problems of loosening or subsidence

  ROM improved
- All had improved constant scores and SPADI scores
- Failures only due to cuff tears/ one malposition

## Outcome Simpliciti

- No cases of anterior or posterior instability
- No infections
- No clinical loosening or subsidence of the humeral component
- No Subscap failures

# Revisions and Reasons

- 5 Complications
- 1 case failed 15 months after a TSA – fell and ruptured cuff – no revision yet
- 2nd case fell 18 months after TSA and ruptured cuff- revised to a reverse successfully
- 3rd case fell and fractured around humeral component/ undisplaced and treated conservatively

# Revisions and Reasons

- 4th case – no real active elevation past 70 degrees or abdn past 60 after TSA

MRI showed thin cuff. No pain and didn't want revision

5th case- Hemi too horizontal/ wear of glenoid

Revised 3 years later to short stem TSA and good result.

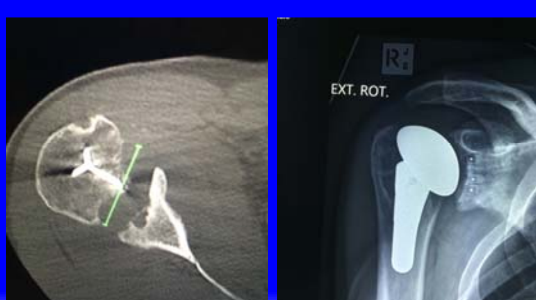
# Revisions and Reasons

- 2 revisions and therefore 2 stemless humeral heads removed.
- First for cuff rupture and the second for malpositioning of the humeral component
- Both had solid bone ingrowth but could be removed after 10 mins with an osteotome around the proximal fixation

## Humeral Cut Too Horizontal

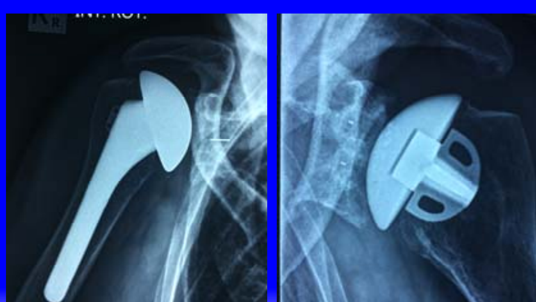

## Humeral Cut Too Horizontal

## Revised to a Short Stem



## Comparison of Stemmed v Stemless

## 6 years Stem v 6 Months Stemless



## Stem v Stemless

- 12 cases of one on each side in last 4 years
- No significant difference in ROM
- No significant difference in pain/function/constant score or SPADI score
- No difference in arm pain
- Only short follow up for the Stemless though (max 5 years)

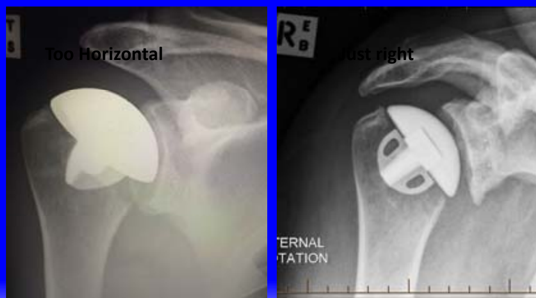
- Well why change? Why not?

## Summary

- Stemless prostheses can achieve very similar clinical results to stemmed prostheses
- Revisions in my hands have definitely been much easier
- Loosening at this stage has not been a problem.
- No arm pain
- No intraop humeral fractures
- Xrays look more anatomic but this doesn't necessarily mean a better ROM!


# Thank You!

## Humeral Cuts




## Subscap Repair

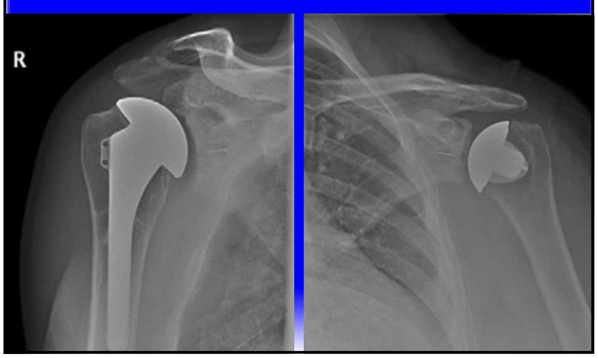
- 6 drill holes lateral to head cut
- 6 No 5 Ethibond sutures
- Close rotator interval with No 2 ethibond sutures

## 25 Affinis stemless

- 18 month max follow up
- ROM improved in all
- Pain decreased
- Constant and Spadi scores have improved
- Xrays – no loosening or subsidence
- No cuff ruptures as yet

# Outcomes!

- No obvious clinical difference between all 3 of the stemless implants I have used
- All have similar postop ROM and mobility



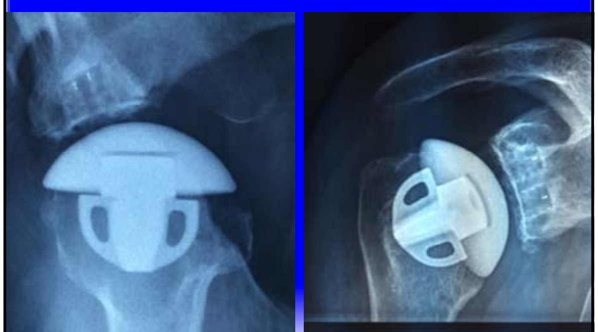

# Stemless

- Started using Tornier at the end of 2011
- Changed to Mathys and Zimmer in 2015
- Now using Mathys/Affinis
- I have not done a stemmed TSA for the last 5 years!

## Things to get right on the humerus

- Take Subscapularis off bone
- Dislocate shoulder and remove ALL osteophytes
- Head cut should be more vertical than previously performed
- Take less bone rather than more at first ( then take more later)
- Leave posterior cuff intact

## Perfect Cut



## Stemless at 3 years