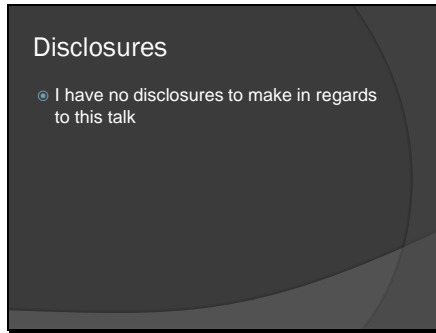


Slide 1




Slide 2



Slide 5

History


- Dee performed first "modern" TEA in 1972!
 - Cement fixation
 - Required resection of bone



Slide 6

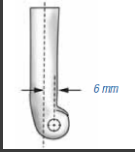
History

- Modern prosthetic design began in mid 1970's
 - Humeral/ulnar components
 - Anterior humeral flange for fixation (1981)
 - Improved cementation
 - Polyethylene bushing



Slide 11

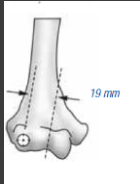
- Flexion-extension axis variable offset
- Relative to diaphyseal axis: 6mm (4-8)



The diagram shows a lateral view of the humerus. A vertical dashed line represents the diaphyseal axis. A horizontal arrow points from this axis to the center of the humeral head, which is labeled '6 mm'. A small circle with a crosshair is located at the center of the humeral head.

Slide 12

- Consistent relationship between center capitellum and trochlear groove
- 15-22.4mm (19mm)



The diagram shows a lateral view of the distal humerus. A vertical dashed line represents the diaphyseal axis. A horizontal arrow points from this axis to the center of the capitellum, which is labeled '19 mm'. A small circle with a crosshair is located at the center of the capitellum.

Slide 17

Indications

- ◉ Terminal osteoarthritis w/ intact extensor/flexor
- ◉ Terminal rheumatoid arthritis
- ◉ Unreparable supracondylar humerus fractures
- ◉ Malunion/Nonunion of elbow fractures
- ◉ Chronic instability

Slide 18

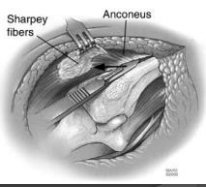
Contraindications

- ◉ Active infection
- ◉ Inadequate soft tissue protection
- ◉ Inadequate motor function to flex the elbow
- ◉ Patient compliance
- ◉ High demand patients (Relative)
- ◉ Dysfunctional hand (Relative)

Slide 21

Technique

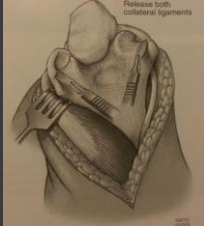
- Triceps
 - Split
 - Reflect
 - Release
 - Tenotomy



Slide 22

Technique

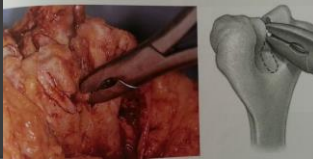
- Collateral ligament release
- Flex, externally rotate forearm
- Allows exposure of joint
- Resect olecranon tip



Slide 23

Technique

- Excise center of trochlea
- Establish humeral canal
 - Burr



Slide 24

Technique


- Ream canal
 - Seeking chatter for fit of implant stem



Slide 27

Technique


- Release brachialis from anterior humeral stem
- Ream humeral canal to accept humeral stem
- Place trial stem



Slide 28

Technique


- Resect proximal olecranon tip for entry



Slide 31

Technique

- Determine ulnar stem
- Trial implant
- Center of implant should align w/ center of articular contour



Slide 32


Technique

- Ensure adequate alignment, motion
- Prepare humeral/ulnar canals
- Place cement restrictors

Slide 33

Technique

- Anterior bone graft
 - Interference fit
 - Provides axial stability




The image shows a red, irregularly shaped bone graft specimen placed on a blue surface next to a metric ruler. Below the ruler is a surgical instrument, likely a retractor system, used for shoulder surgery.

Slide 34

Technique

- Cement humerus
- Cement ulna




Two side-by-side photographs showing the application of bone cement. The left image shows a surgical site on a humerus with a white cement applicator. The right image shows a surgical site on an ulna with a white cement applicator.

Slide 35

Technique

- Place implants
- Align and place coupling pin
- Hold implant in extension while cement cures



Slide 36

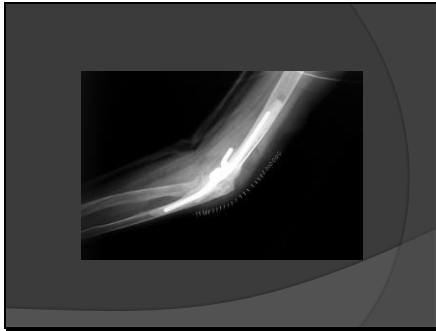
Postoperative Care/Rehab

- Extension splint w/ anterior slab
- Drain
- Begin motion at two weeks
 - Depending on triceps approach
 - Likely passive w/ active assist
- Lucky if get 20-130°
- Lifetime weight restriction < 5 lbs.

Slide 41



Slide 42



Slide 43



Slide 44

Hemiarthroplasty

- Distal humeral hemiarthroplasty
 - First described in 1947
- Indications
 - Non-repairable trauma (acute** and chronic)
 - AVN of trochlea w/ collapse of subchondral bone
 - Tumor resection of trochlea
 - Inflammatory joint disease ??

Slide 45

Hemiarthroplasty

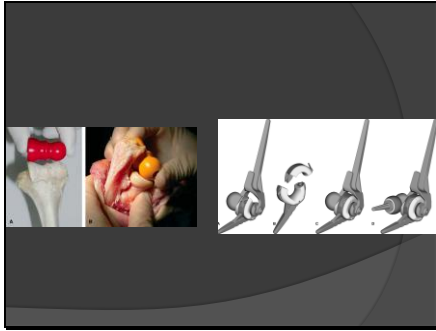
- ⊙ Contraindications
 - Infectious foci
 - Inadequate NV status
 - Insufficient bony column support
 - Poor soft tissue coverage

Slide 46

Hemiarthroplasty

- ⊙ Requirements
 - Intact radial head, coronoid
 - Medial, lateral columns of distal humerus
 - Collateral ligaments (intact or repairable)
 - Must have high degree of bony congruency

Slide 49



Slide 50



Slide 53




Slide 54



Slide 55

King et al, JSES 2012

- Excision capitellum increased v-v laxity 3.1°
 - In pronation, not supination
- Capitellar implants maintained v-v laxity

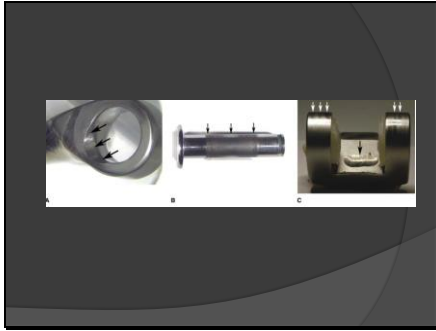


Slide 56

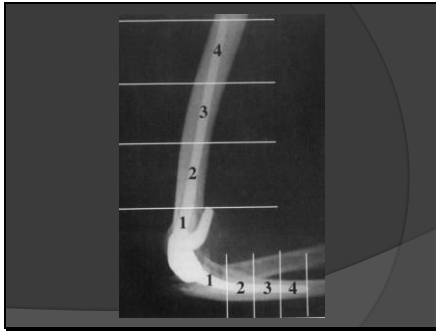
King et al, JHS Am 2012

- Found radiocapitellar arthroplasty mimics normal kinematics in the elbow w/ intact UCL
- Improves but does not equal normal kinematics in the elbow w/ deficient UCL

Slide 63



Slide 64



Slide 65

Complications

- Infection
 - 3-8% deep infection rate
 - Antibiotic cement decreases rate (11->5%)
 - S. Aureus, S. Epidermis
 - S. Epidermis produces biofilm
 - Pain and drainage most reliable findings
 - ESR 30-55

Slide 66

Complications

- Be aggressive w/ treatment
 - If implant in <3 weeks, retention favorable
- 77% implants retained <3 years to revision
 - 48% when revision done at 8 yrs

Slide 69

Complications

- Triceps insufficiency
 - 2-8%
 - Dependent upon approach used
- Pt. c/o weakness
 - Elbow extension
- Surgical repair
 - Achilles allograft augmentation
 - Anconeus rotational flap

Slide 70

Case

Slide 71

CC

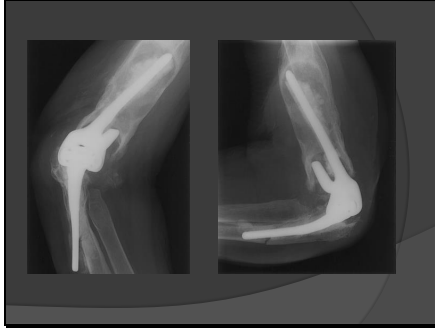
- 10/18/11
- CC:**
 - R elbow pain after fall
- HPI:**
 - 42 yof RHD fell from standing height
 - Hx of RA and R TEA approximately ten years ago
 - Precedent pain prior to the fall, exacerbated by fall
 - Occasional n/t in her SF/RF, not new since fall
 - Denies F/C, recent illnesses

Slide 72

CC

- PMHx:**
 - RA, TEA 10 yrs ago
- OTW** unremarkable
- PE:**
 - Wounds benign, no drainage or erythema
 - No TTP
 - ROM: Flex/ext:-20-95, Pro/Sup: 90/90
 - Neurovascular exam intact, Tinel's at elbow anteriorly

Slide 73

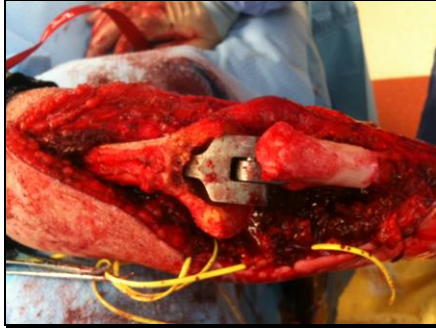


Slide 74

CC

- Dx:
 - Osteolysis, humeral and ulnar implant loosening with olecranon periprosthetic fracture
- Plan:
 - Symptomatic control
 - Allow holiday season to pass and address surgically after the new year

Slide 77

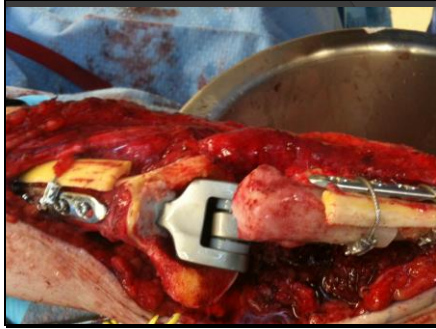


Slide 78

CC

- 1/27/12 cont'd.
- Finished fixation of the plates proximally and distally
- Placed 1.0mm Synthes cerclage cables around proximal allograft struts on humerus and ulna
- Triceps fixed to proximal ulna through drill holes with No. 2 Ethibond
- 10 Fr. HV placed

Slide 79



Slide 80

CC

- 2/1/12:
 - First post-op visit
 - Wound benign
 - Placed into long arm cast
