Hip Arthrodesis, is it Indicated?

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Topics

• Indications
• Procedure itself
• Complications
• Outcome of arthrodesis
• Comparison with THR
• Conversion to THR outcomes
Yes!
(Of course, well maybe)
Hip Arthrodesis

• Dee, Hurst and Gruber state -
  “Hip arthrodesis remains an acceptable alternative to hip arthroplasty in certain indicated cases”
Hip Arthrodesis

- Huesner 1884
- Lagrane 1886
- Albee 1908 in USA
- Farkas 1939 used subtrochanteric osteotomy
Early Indications

- Infection
- Trauma
- Perthes
- SUFE
- OA
- DDH
- Other painful conditions
Indications

• As either a temporary or definitive operation, (but with a view to THR in the future)

• As a permanent salvage procedure for patients who have had a THR
Contraindications

- Neuropathic joints
- Compromised bone stock
- Osteonecrosis
- Ipsilateral knee pain
- Back pain eg OA/spinal fusion etc
- Female
Indication for Arthodesis
More Indications
Operations Possible

- Multiple described
- Combination of the two
- Intra articular
- Extra articular
Ideal Hip Arthrodesis

• Use intra and extra articular approaches
• Maximise bony contact
• Rigid internal fixation
• Compression at fusion site
• Minimal shortening
Hip Arthrodesis Position

- 25-35 degrees Flexion
- 0-10 degrees External Rotation
- 0-10 degrees Adduction
Methods of Arthrodesis

- Smith Petersen nail
- Curved plate
- Lag screw & side plate
- Compressible nail bolt
- Transarticular nail
- Cobra Plate
- Harris bolts
- Screws/washers
- Knowles pins
- Pedicle bone graft
- DHS
- External fixator
Hip arthrodesis was performed on 40-year-old construction worker who developed posttraumatic osteonecrosis. A, Hip arthrodesis was performed using six bolts, including two that passed through the greater trochanter superior to the femoral neck. Bony apposition is excellent, and there is rigid internal fixation under compression. B, Union was successfully achieved. (From White RE Jr: The Hip, vol 12, St Louis, 1984, Mosby-Year Book, Inc.)
Cobra Plate Fusion

- Popularised by AO in 1974
- Developed by Schneider
- High union rate 92.4%
- No spica needed
- Damage to Abductors
Schneider Technique
Radiological Example

Hip Fusion
Radiological Example

McKee fusion with lag screw and plate
Radiological Example
Complications of the Operation

- Non union
- Position
- Stiff knee
- Other joints
- Reactivation infection
Load sharing
Load sharing
Outcome of Arthrodesis

- Retrospective, 28 patients
- Age at index operation 25y (10-58)
- Arthrodesis 35 years (17-50) earlier
- All personally examined
- XR/hip scores etc
Outcome of Arthrodesis

- Fused for 35y (17-50)
- No hip pain
- 6 arthroplasty
- 2.7 cm leg length discrepancy
- 20 walked > 1 mile
- 6 walked 0.5-1 mile
- 5 unrestricted walking
- 18 comfortable sitting
- All could drive
- 23 full time employed for average 27 y
- 8 heavy manual jobs
- All women conceived
- 5/6 had C.S
Outcome of Arthrodesis

- 17/28 had back pain
- began 25y post op
- episodic

- 16/28 had knee pain
- 22/28 mediolateral laxity
- 21/28 AP laxity
Outcome of Arthrodesis

- 9/22 mild limp
- 7/22 moderate limp
- 6/22 severe limp - adduction abduction

- 6/28 THR 40y after fusion
  relief of back pain
  better sitting
  better generally
  all Trendelenburg
  1 revised
  0 dislocation
Outcome of Arthrodesis

- 53 patients
- 38y post arthrodesis
- Age at operation 14y (3-35)
- Treatment with extra-articular fusion, and cast for 3-18 months
- 6 converted to THR
Outcome of Arthrodesis

- 78% satisfaction score
- Even higher if <18y at operation
- 18% manual jobs
- 45/53 employed, 4/53 were housewives
- 33y working time
- 34% no limitations
- 40% walk >5 miles
- 16/23 childbirth
- 6/23 C.S
Outcome of Arthrodesis

- 57% back pain
- mainly episodic
- none incapacitating
- none treated surgically

- 45% (ipsi) knee pain
- multidirectional laxity
- >10 add = valgus knee
- <10 add = varus knee
- 2 had TKR (ipsi)
- 1 tibial osteotomy
- 1 femoral osteotomy
Outcome of Arthrodesis

- 17% (contr) hip pain
- 23/58 had XR changes
- OA not related to length of fusion

- Arthrodesis position
  - 38 flexion (10-60)
  - 0 rotation (-13-30)
  - 4 abd (-10-30)

- 2 fractures
- 13% THR (ipsi)
- 2 TKR
Summary of Outcome

• High satisfaction scores
• Good long term function employment mobility symptoms
• Low rate of conversion to THR
• Sports
THR in the young

- Difficult problem
- High patient demand
- Generally do poorly
THR in the young

- 29 patients/33 hips
- 67 months post THR
- 23y at index operation (14-33)
THR in the young

- 18/33 excellent Harris Hip scores
- 6/33 were good
- 9 were fair or poor
- 7 had/booked for revision
- For pain mainly
- 5/33 had asymptomatic migration on XR
- 97% had radiolucent lines at 5y, <2.5mm
THR in the young

- 57% actual or potential loosening at 5y
- 45% problems were acetabular
- 3/5 patients >180lbs had problem THR’s
- Were critical of the technique in 16/18 problem joints
- Also for 10/15 other joints
- AVN joints did worse
THR in the young

- 81 cemented THR
- All <45y
- Follow up 9.2y (5-16.5)

LD Dorr, Clin Orth,260,1990
THR in the young

- 33% revised for aseptic loosening
- 2% removed for infection
- 7 of the revisions have been re-revised
- 35% revised if <30y
- 58% of hips were satisfactory, ie hip score
THR in the young

- Major changes from 5y review of group
- Satisfaction 78% → 58%
- Revision 12% → 35%
- Impending 27% → 56%
Comparison THR/Arthrodesis

• Difficult 2 different groups
• Higher satisfaction scores for arthrodesis
• Better long-term results for arthrodesis
• Arthrodesis group run into problems after 20y
• No long term results on THR ie 15-20y
Conversion to THR

- 60 patients had arthrodesis
- Age at arthroplasty 49y (24-70)
- Trauma, JRA, DDH, SUFE, Perthes, TB, Infection & OA
- Review 10y post conversion
- 66% reviewed
- 33% revised
Conversion to THR

• 18/40 good/excellent hip
• 13/40 fair
• 50% mobilised freely
• 5% used the occasional stick
• 30% revision rate (infection/aseptic)
Conversion to THR

• Worse outcome for <50y at time of arthroplasty
• Much better results for spontaneous ankylosis
• Failure rate not dependent on length of arthrodesis
TKR/THR

- 20 patients
- 14 Hips and 9 Knees
- 57y at arthroplasty
- 32y from arthrodesis
- reviewed at 8y
- 5 patients lost
TKR/THR

- **Hips**
  - 5 excellent
  - 5 good
  - 4 fair/poor
  - 3 poor were revised
  - 3 good/excellent had radiolucency

- **Knee**
  - 3 excellent
  - 4 good
  - 2 fair/poor
  - 7 required MUA
  - 1 prog radiolucency
Conclusion

- Arthrodesis has a place
- Can be considered definitive/temporary
- Newer techniques preserve abductors
- Position of fusion is vital
- Arthroplasty later is demanding
Conclusions

• Arthrodesis is indicated
• Have a good long term function
• Need to convince patients of it
• THR may not be best!
Thank You