Assessment and management of the loose femoral component

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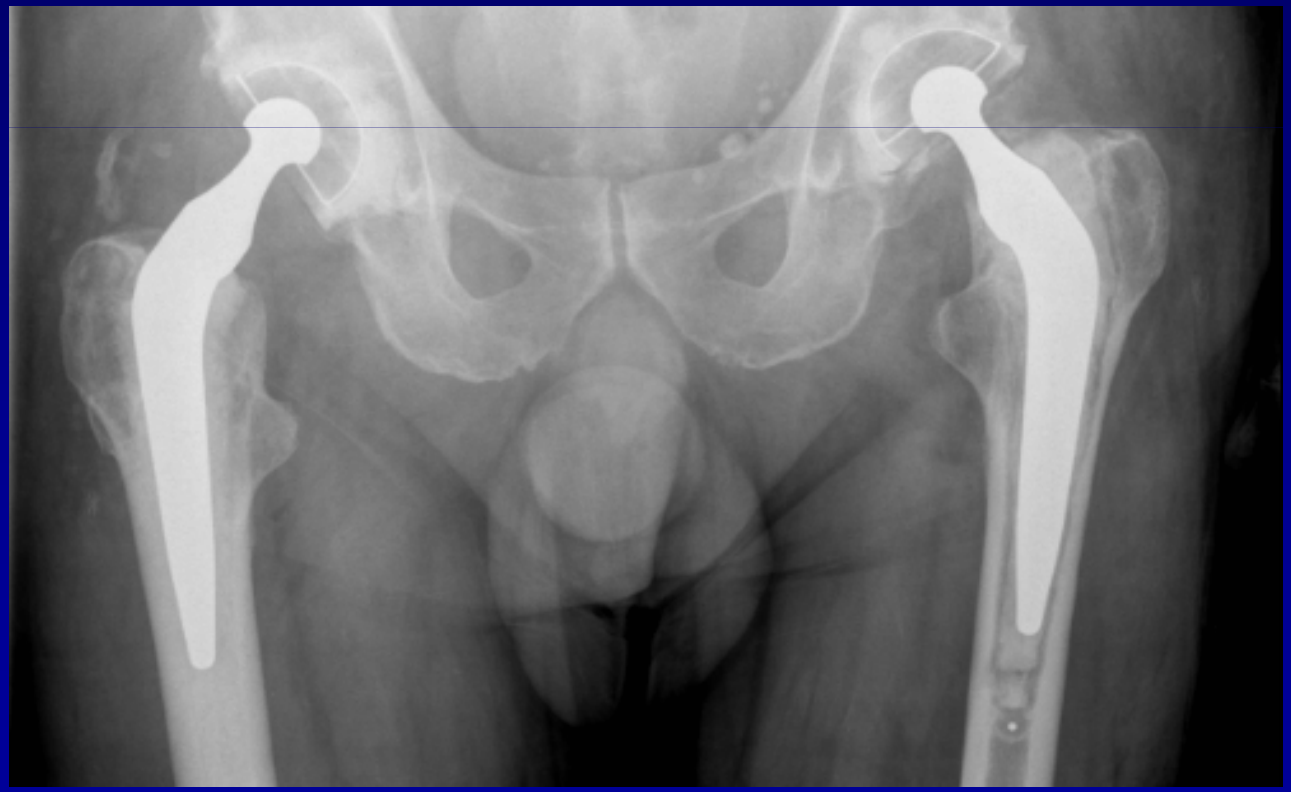


Evaluation of The Painful Total Hip Arthroplasty

History

Pain Intrinsic versus Extrinsic

Location, temporal sequence, characteristics

The primary

Examination

Lumbar spine and all lower extremity joints

Neurovascular examination

Gait, hip abductor function, limb length discrepancy

Diagnostic Evaluation

- **X-rays** — **LOOSENING** — **OSTEOLYSIS**

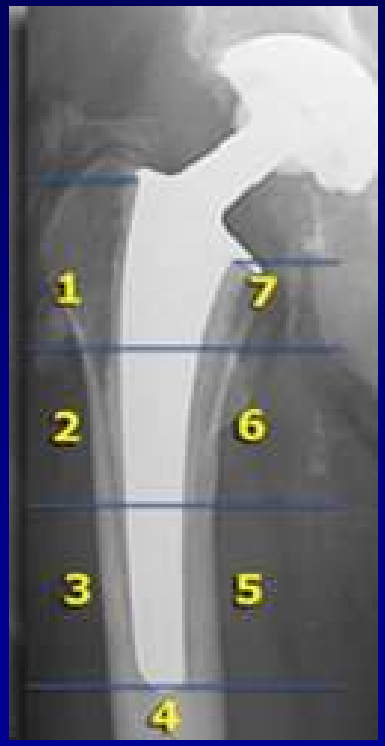
Serial radiographs

Gruen's zones

Harris Classification — **CEMENTED**

Engh Classification — **UNCEMENTED**

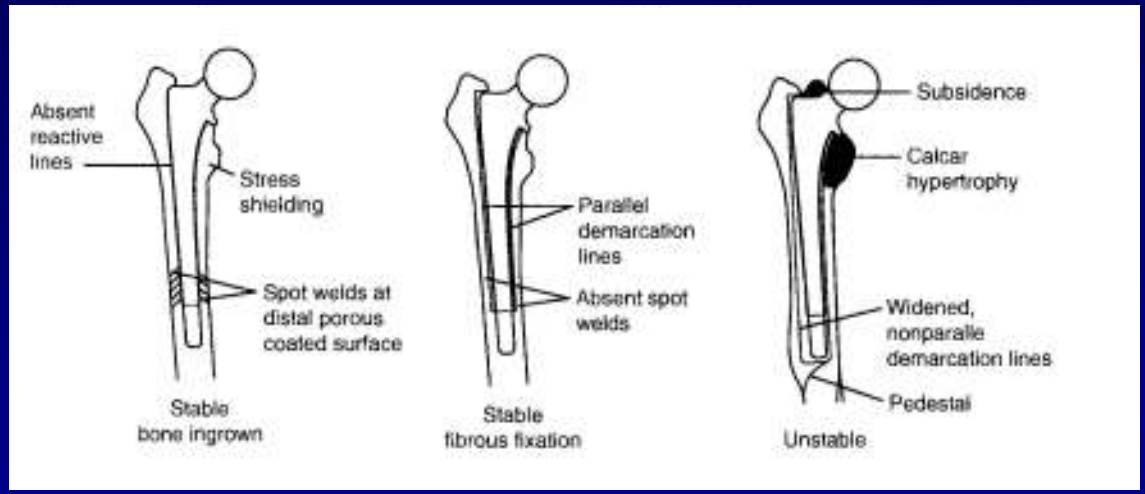
Gruen's zones



HARRIS CLASSIFICATION

Definite	component migration or cement fracture
Probable	complete radiolucency at bone cement interface
Possible	radiolucent zone between 50 and 100%

ENGH CLASSIFICATION



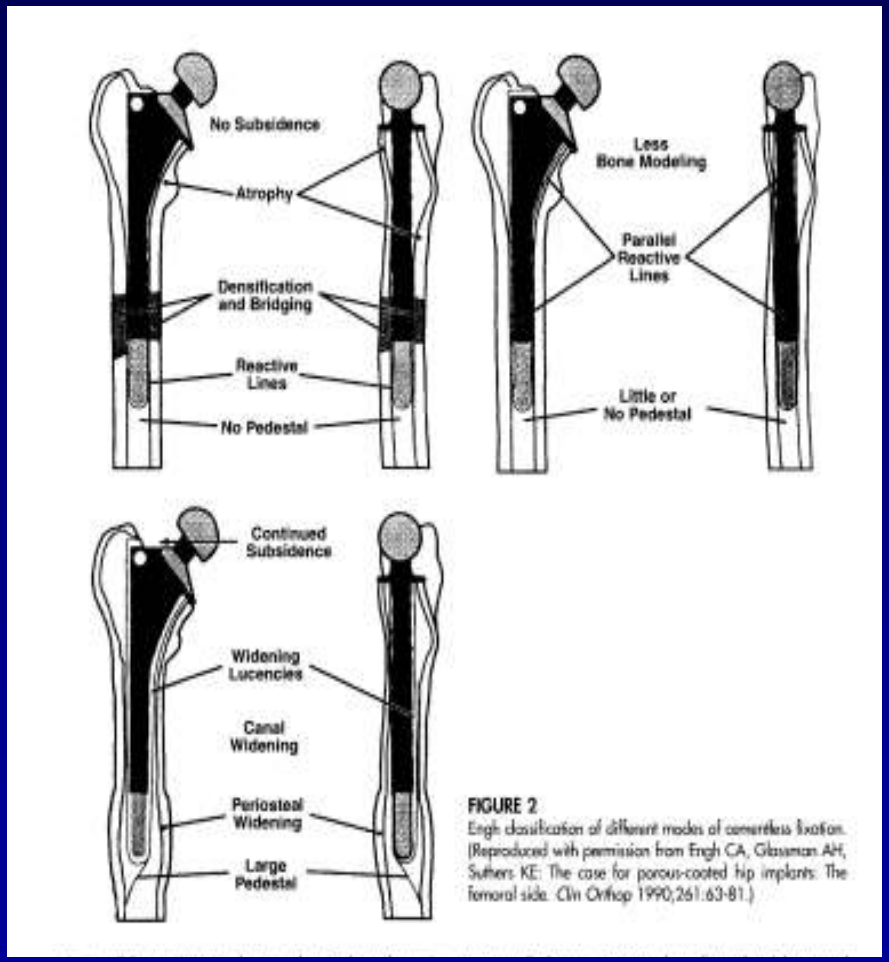


FIGURE 2
Engh classification of different modes of cementless fixation. (Reproduced with permission from Engh CA, Glassman AH, Suthers KE: The case for porous-coated hip implants: The femoral side. *Clin Orthop* 1990;261:63-81.)

LABAROTORY STUDIES

- FBC
- ESR
- CRP

SCINTIGRAPHY

- BONE SCANS
- WHITE CELL SCANS

HIP ASPIRATION , BIOPSY, FROZEN SECTION ANALYSIS

THE GOLD STANDARD

Intra-operative biopsies

SURGICAL OPTIONS

- **AIMS**

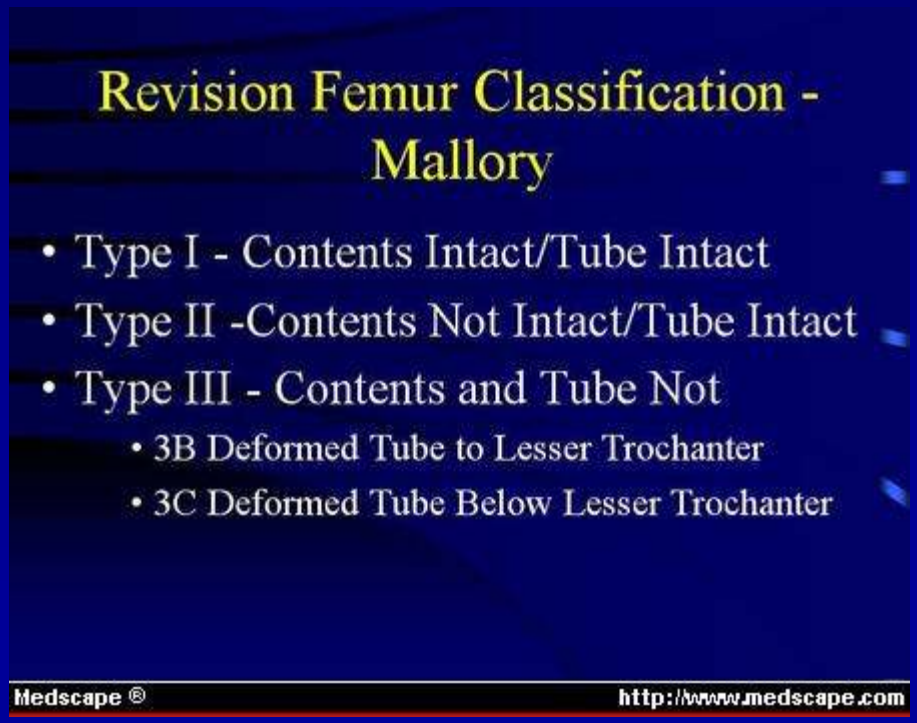
STABLE PAIN FREE HIP WITH RESTORATION OF NORMAL BIOMECHANICS AND RESTORATION OF FUNCTION ….. RECONSTITUTE BONE STOCK??

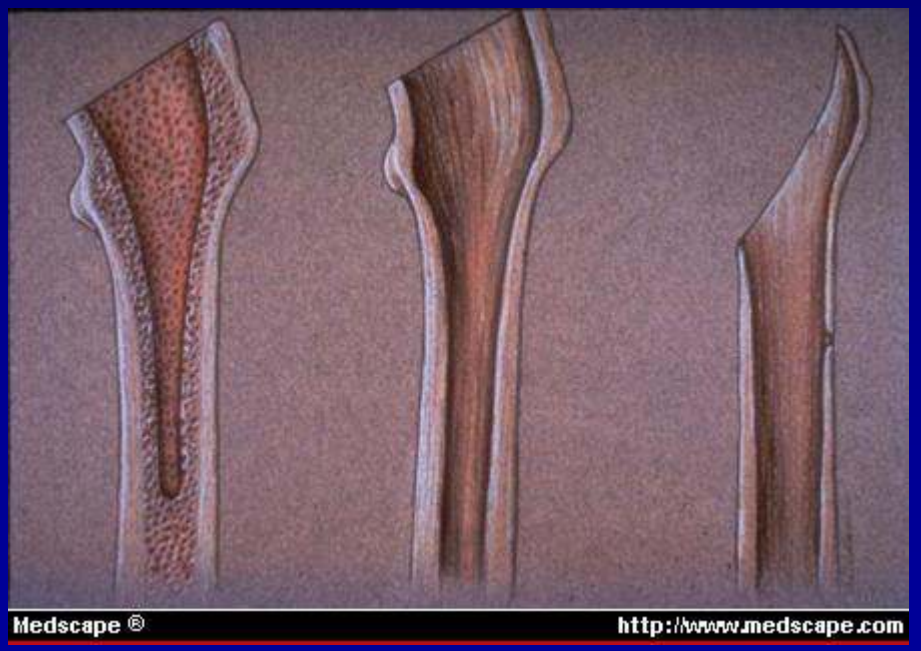
CEMENTED

UNCEMENTED

CLASSIFICATION OF FEMORAL DEFECTS

- **AAOS**
- **PAPROSKY**
- **MALLORY**





CEMENTED REVISION

CEMENT IS A GROUT

EARLY GENERATION CEMENTING TECHNIQUES

HIGH FAILURES AND REREVISION RATES

INDICATIONS: FEW AND FAR BETWEEN

….CEMENT IN CEMENT REVISION

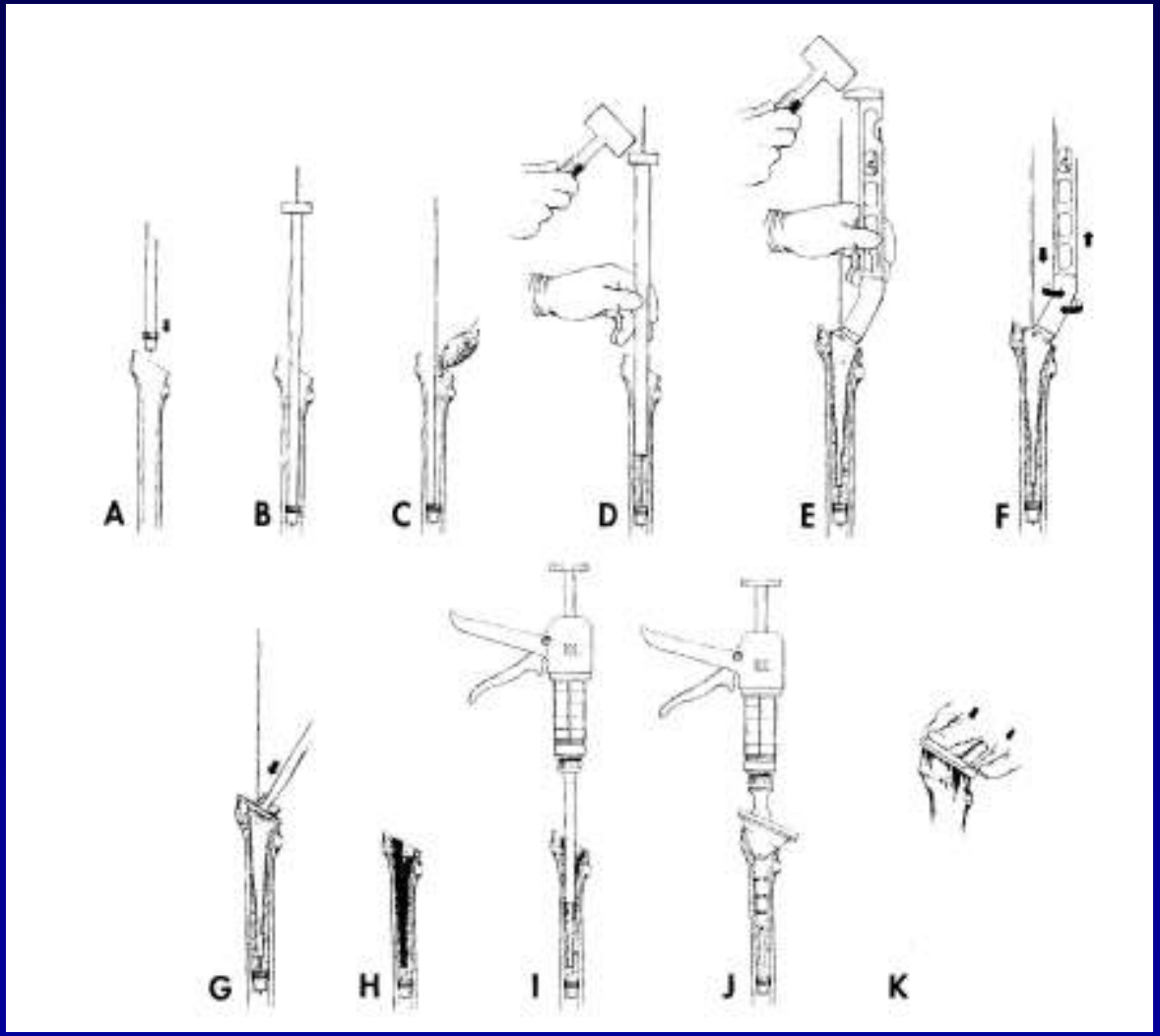
…….IMPACTION ALLOGRAFTING

……..STRUCTURAL ALLOGRAFTS

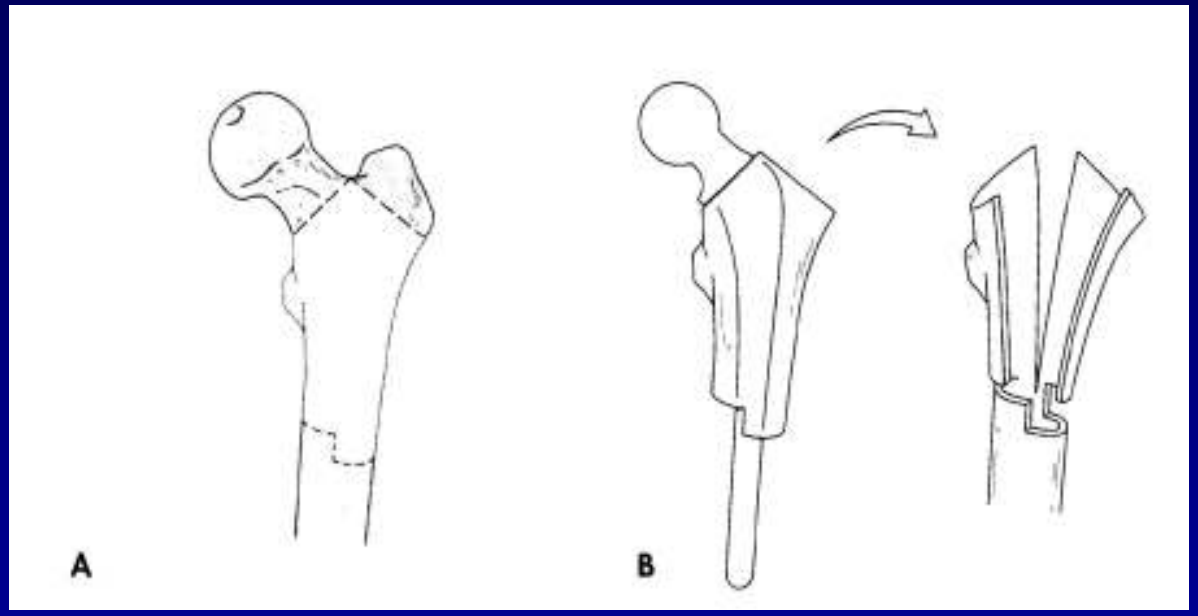

Se 1
Im 1
hip ARVOBL


Se 1
Im 1
AP

IMPACTION ALLOGRAFTING



ALLOGRAFT PROSTHETIC COMPOSITE & STRUT GRAFTS



UNCEMENTED FEMORAL REVISION

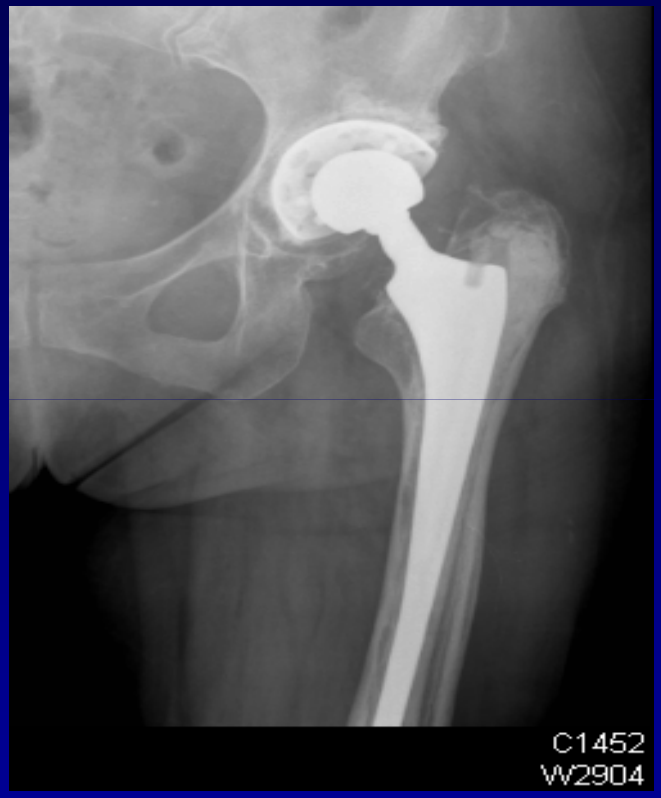
- PROXIMALLY POROUS COATED

- EXTENSIVELY POROUS COATED

MODULARITY

DISTALLY LOCKED STEMS

TUMOUR PROSTHESIS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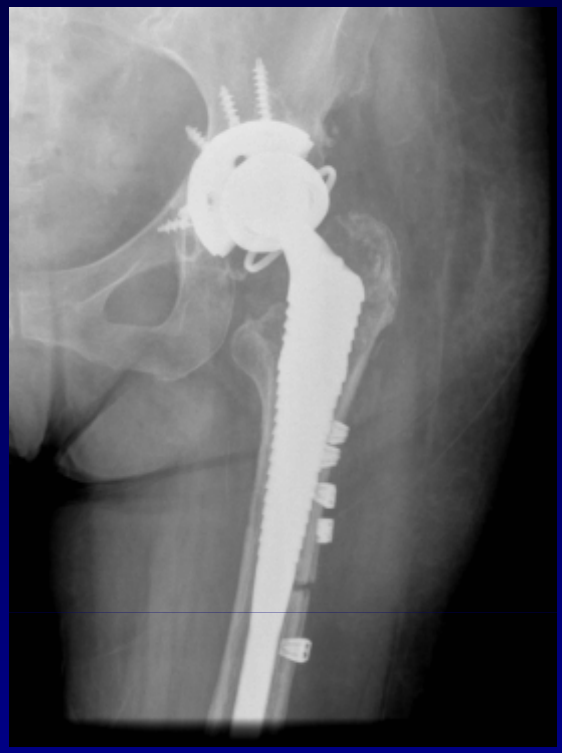


Se:1
Im:1
Femur LAT

OPERATIVE TECHNIQUE AND CONSIDERATIONS

- PRE-OPERATIVE PLANNING
- PATIENT POSITION
- SURGICAL APPROACH
- OSTEOTOMY …OR NOT
- INSTRUMENTATION
- COMPONENT AND CEMENT EXTRACTION
- STEM INSERTION……BE CAREFUL!
- REPAIR

POST OPERATIVE MANAGEMENT

- HDU / ITU
- ANTIBIOTICS
- ANTI DVT PROPHYLAXIS
- WEIGHTBEARING STATUS

OUTCOMES

RESULTS OF CEMENTED FEMORAL REVISION

Authors	Mean Follow-up, Years	Number of Hips	Good/ Excellent Results, %	Re-revision Rate, %	Radiographic Evidence of Femoral Loosening, %
Hunter et al[26]	0.5*	140	24	32% infection rate with 22% resection arth	— —
Amstutz et al[13]	2.1 (mean)	66		9.0	29.0
Pellicci et al[22]	3.4 (mean)	110	60	5.4	13.6
Huo and Salvati[15]	4.1 (mean)	113	83	3.0	16.0
Kavanagh et al[16]	4.5 (mean)	166	52	6.0	44.0
Kilgus et al[18]	5.1 (mean)	92	—	9.0*	—
Mohler et al[20]	5.5 (mean)	96	—	7.0	13.0
Raut et al[23]	7.3 (mean)	39	—	—	5.1
Raut et al[24]	7.5 (mean)	399	—	5.0	7.8
Iorio et al[12]	7.7 (mean)	107	—	3.8	16.0
Pellicci et al[22]	8.1 (mean)	99	63	12.0	29.0
Marti et al[19]	8.9 (mean)	60	—	5.0	32.0
Stromberg et al[27]	10.0 (mean)	51	—	41.0	59.0
Kavanagh et al[17]	10.0 (mean)	210	—	30.0	—
Garcia-Cimbrelo et al[14]	11.5 (mean)	155	—	12% at 10 yr 29% at 10 yr	16% at 16 yr 38% at 16 yr
Callaghan et al[28]	3.6 (mean)	139	66	4.3	12.0
Collis[29]§	4.6 (mean)	110	93	3.6	5.0
Ballard et al[30]§*	5.0 (mean)	27	—	0.0	0.0
Rubash and Harris[31]§*	6.2 (mean)	43	72	4.0	11.0
Weber et al[32]§*	6.2 (mean)	139	—	2.1	8.3
Izquierdo and Northmore-Ball[33]§*	6.5 (mean)	139	—	2.2	4.4
Stromberg and Herberts[21]§*	7.0 (mean)	57	—	7.0	21.0
Pierson and Harris[34]§*	8.5 (mean)	29	86	6.9	14.0
Estok and Harris[35]§*	11.7 (mean)	38	58	10.5	21.0†
Katz et al[36]§*	11.9 (mean)	50	—	9.5	26.0†
Mulroy and Harris[37]§*	15.1 (mean)	35	—	20.0	26.0†

*Minimum follow-up, years
†Combined revision plus loosening rate
§A second-generation cementing technique was used

RESULTS OF CEMENTLESS FEMORAL REVISION

Authors	Component	Number of Hips	Mean Follow-up, Years	Results
Hedley et al[45]*	PCA	61	1†	9.5% femoral loosening
Harris et al[47]*	Harris-Galante	23	2†	4% femoral loosening
Gustilo and Pasternak[48]*	BIAS	57	2.8	4% femoral revision
Malkani et al[49]	Omnifit	69	3.0	9% re-revision rate
Chandler et al[50]*	S-ROM	52	3.0	4% re-revision rate, 10% mechanical loosening rate
Smith et al[38]*	S-ROM	66	3.4	0% re-revision rate, 7.6% mechanical loosening rate
Cameron[51]*	S-ROM	91	3.5	0% re-revision rate, 2.2% mechanical loosening rate
Meding et al[52]*	PCA and BiMetric	32	3.6	0% re-revision rate, 18% mechanical loosening rate
Trousdale and Morrey[53]*	BIAS	96	4.2	10% re-revision rate 37% subsidence (>2 mm)
Rivero et al[54]*	BIAS	48	4.2	4% re-revision rate 31% subsidence (•4 mm)
Head et al[55]*	Proximal coated/ colcar repl. with struts	174	3 to 9§	3.4 % re-revision rate
Hussamy and Lachiewicz[56]*	BIAS	41	4.5	0% re-revision rate, 32% subsidence (mean, 8 mm)
Mulliken et al[36]*	Mallory-Head	52	4.6	10% re-revision rate 23% mechanical loosening rate
Berry et al[39]*	Proximal porous coating (6 implants)	375	4.7	16.8% re-revision rate for aseptic femoral loosening or osteolysis
Buoncristiani et al[57]*	APR	66	4.7	4.5% re-revision rate
Dorr et al[4]*	APR (collarless)	100	—	50% re-revision rate, 50% subsidence
	APR (collared)	75	—	< 1% re-revision rate, 0% subsidence
McCarthy et al[58]*	S-ROM	133	5	1.5% re-revision rate, 4% subsidence
Woolson et al[59]*	HGP	28	5.5	20% re-revision rate 52% mechanical loosening rate
Peters et al[60]*	BIAS	49	5.5	96% survival rate (6 y)
Jones and Hungerford[40]*	PCA	91	6.5	10% re-revision rate
Engh et al[61]	AML	127	4	4% femoral loosening
Moreland and Bernstein[79]	AML	175	5	2.5% re-revision rate, 2.9% mechanical loosening rate
Lawrence et al[62]	AML	174	8.4	5.7% re-revision, 90.6% survival rate (10 y)
Paprosky et al[64]	Solution	170	13.2	4.1% re-revision rate

*Proximal porous-coated
†Minimum follow-up, years
§Range of follow-up, years
¶Extensively porous-coated