Case Report: Post-traumatic OA of hip joint

Intern: 8611046 徐釗儀

指導老師: 骨科 簡瑞騰主任

History

- 48y/o man
- traffic accident on 6/6/2004
  - Hemopneumothorax
  - Rt femoral shaft & neck fx
  - left acetabular fx with left hip dislocation
- 1st day: ORIF for Rt femoral shaft fx, chest tube, traction of left leg
- 2nd day: ORIF of Rt femoral neck fx
- 3rd day: ORIF of Lt acetabular fx
- Postop: ambulation with aid of a walker

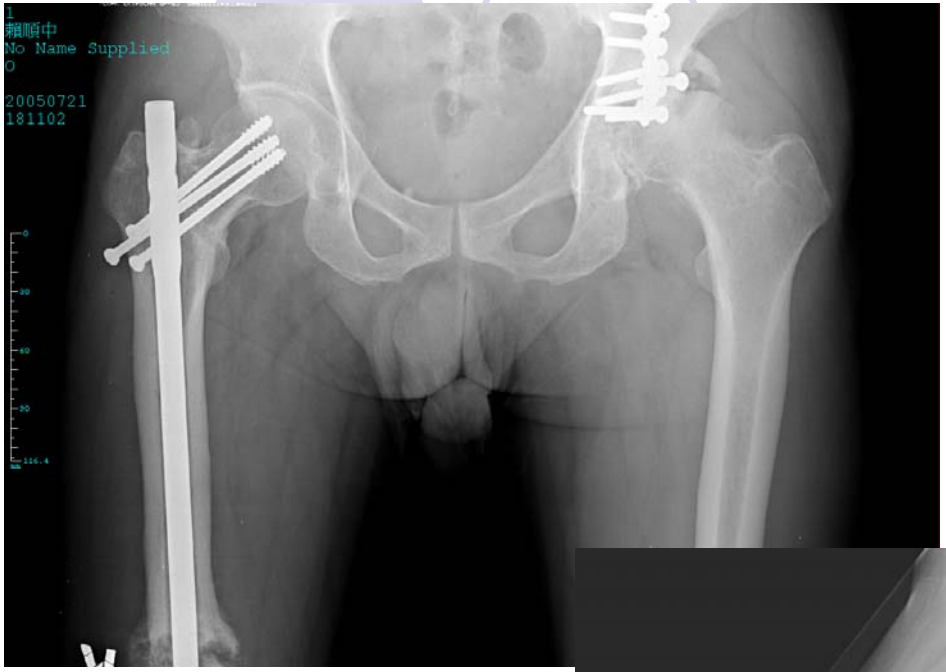
History

- Mar, 2005
  - dynamization with removal of proximal locking screws of Rt femur
  - Rt leg pain getting worse
- Jun, 2005:
  - Limping and painful crepitation of Left hip
  - BW loss:12kg

PE

- 7/21/2005: came to OPD on wheelchairs
- no limitation of ROM of bil. Legs
- Couldn’t raise legs on his own
- Muscle atrophy(+)
- Distant circulation, sensation, motion preserved
- Lt hip:
  - Patrick test (++)
  - Painful crepitation on internal rotation

07/21/2005

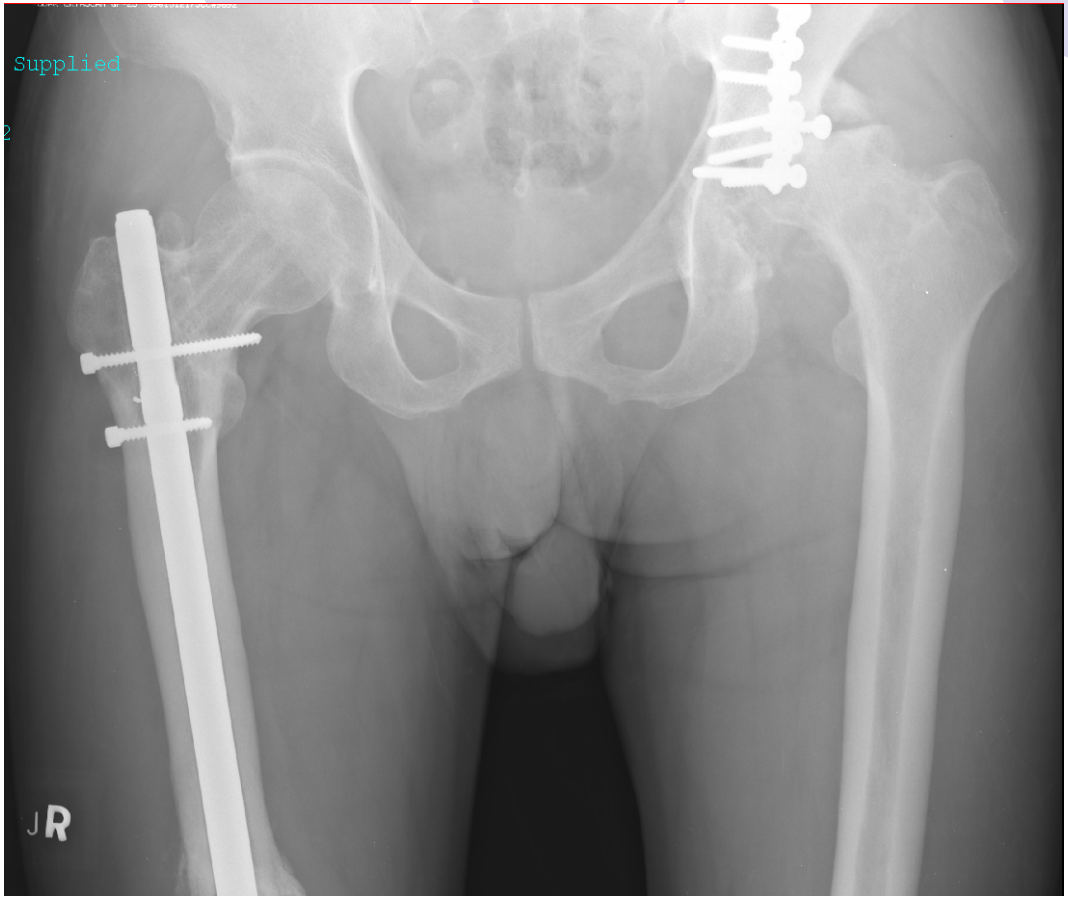


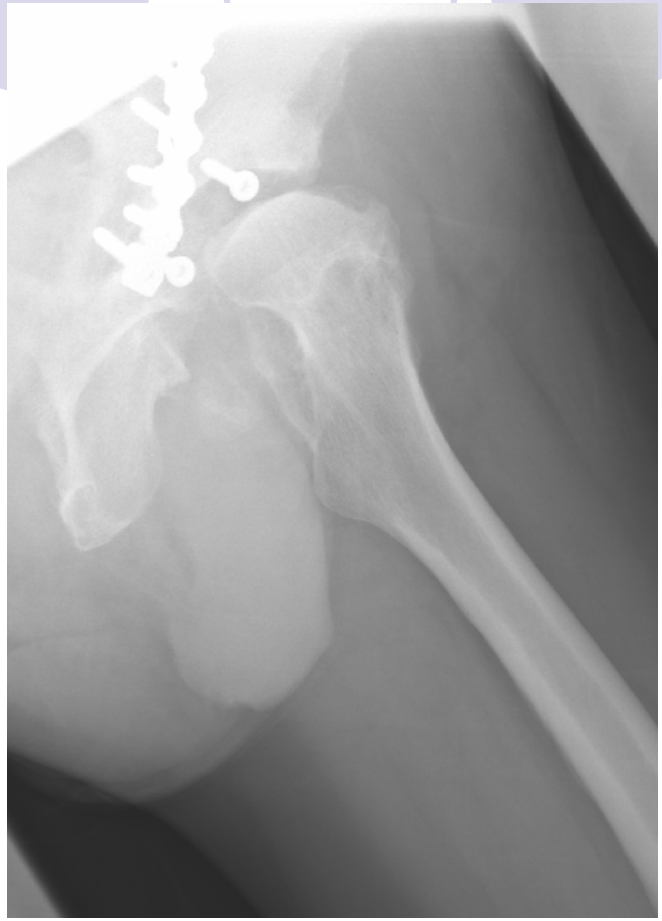
1st op

- 2005/8/3
- Osteosynthesis for nonunion of Rt femoral shaft fracture by removal of implant and exchange of a larger nail

Post-op

- Rt leg pain improved
- Lt hip pain with crepitation aggravated
- 09/22/2005 admitted for left THR





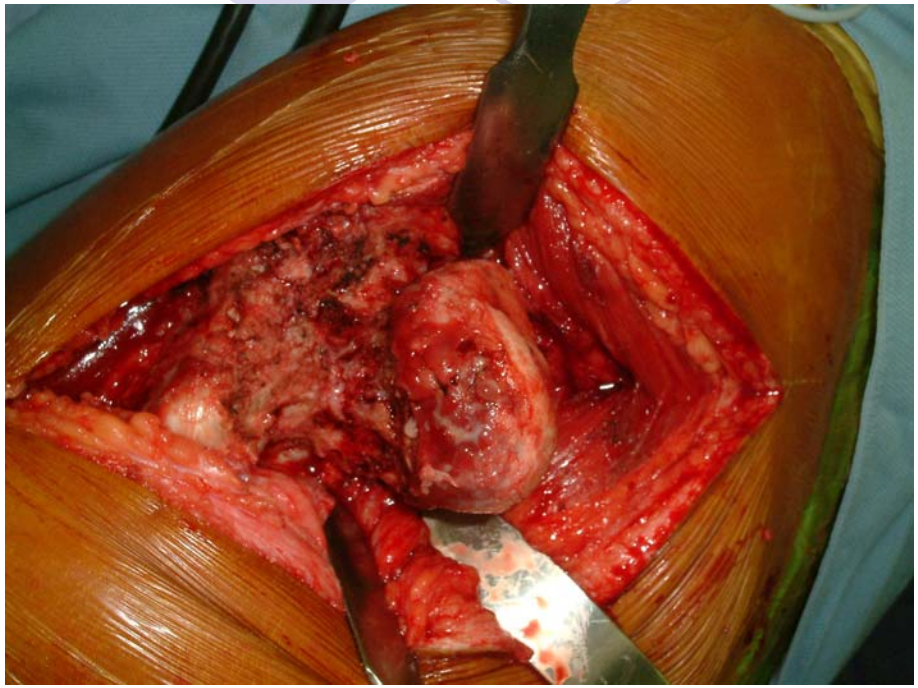
09/22/2005, post-traumatic OA

09/23/2005

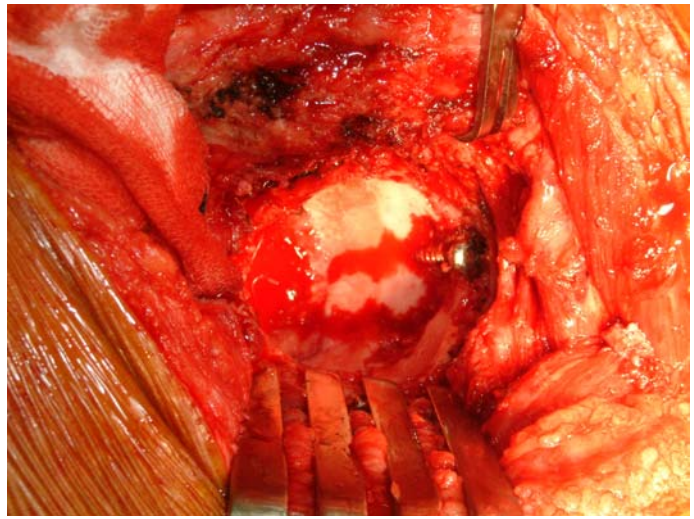
- Op procedures: THR with ceramic head/insert
- Op findings:
  - Solid union of post. rim fx of Lt acetabulum
  - s/p reconstruction plate and interfragmentary screw x 2

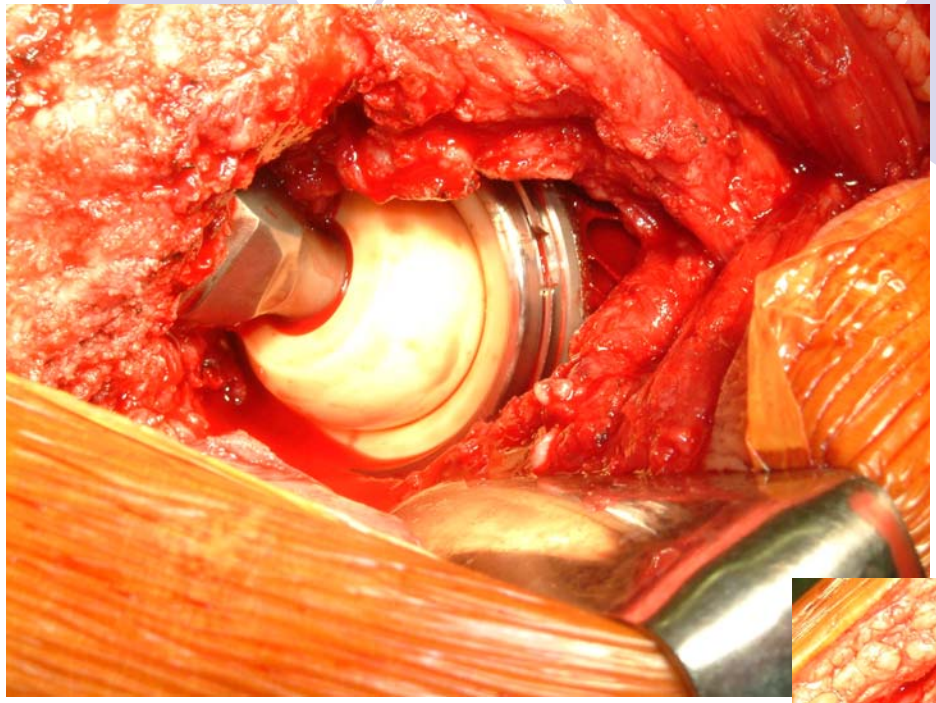
Femoral head

Marked cartilage erosion, subchondral bone exposure, deformed with asphericity

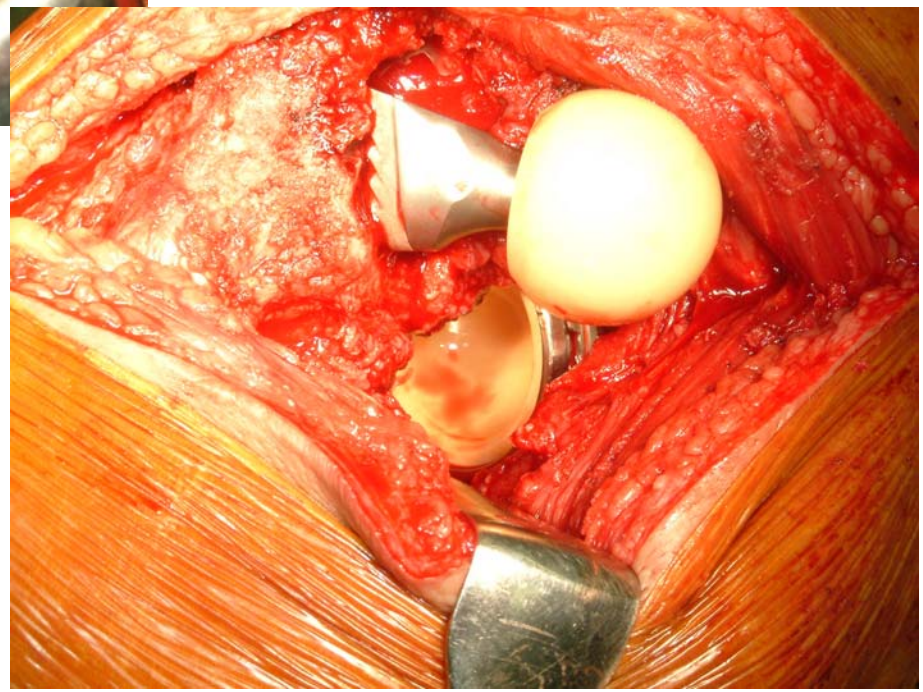


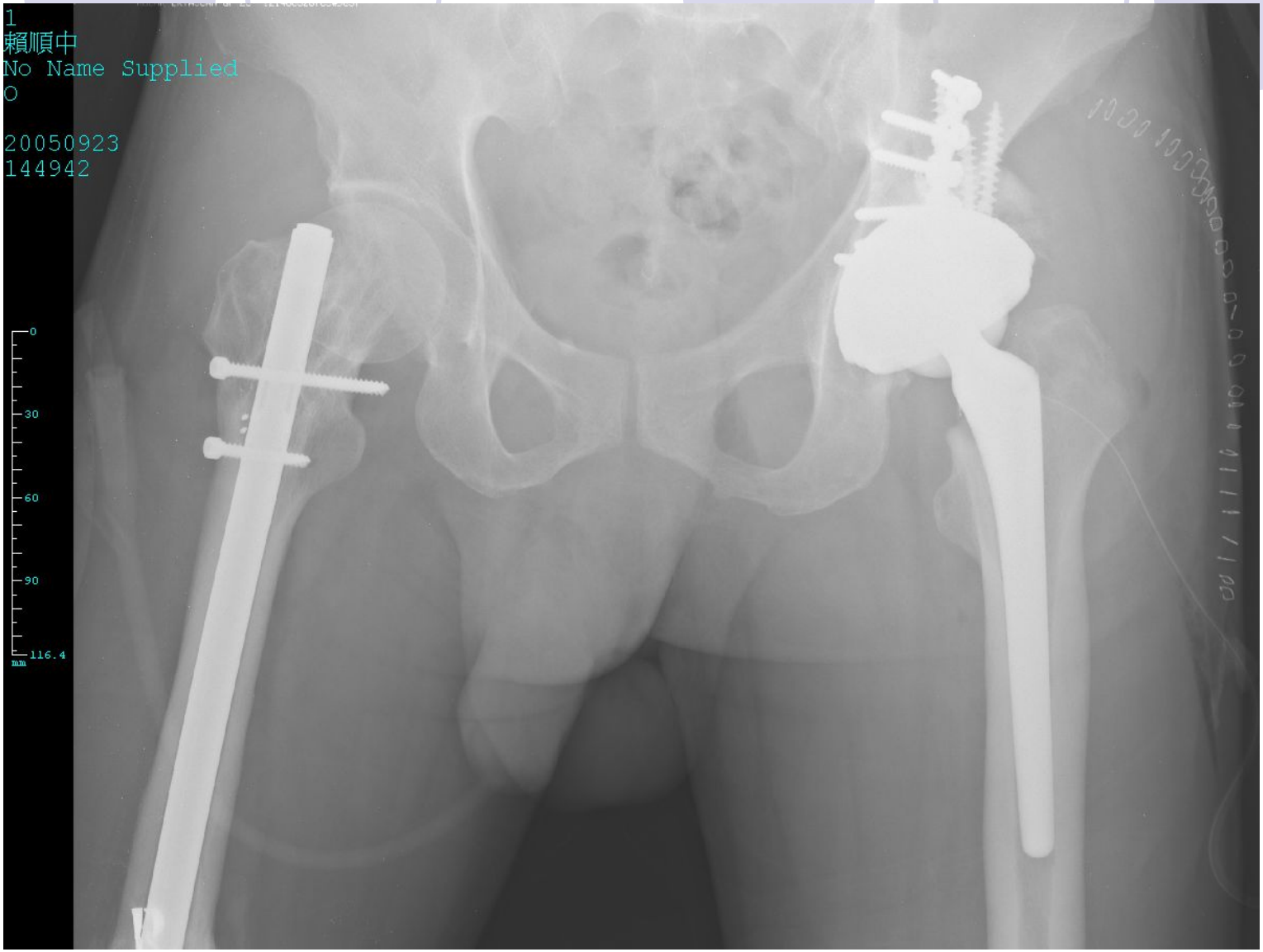
Acetabulum: Preserved cartilage





•ceramic head/insert

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Discussion

Indications for Left THR

- 髖關節疼痛硬程度已達到連坐、走路、彎身都覺得困難
- 吃藥已經無法控制疼痛
- Disuse atrophy of quadriceps or gluteal muscle
- X光關節間已完全沒有間隙→關節面軟骨已嚴重磨損破壞

Discussion

- How’s the clinical result of ceramic THR for post-traumatic OA after acetabular fx?

PIOC

- People: post-traumatic OA after acetabular fx s/p ORIF
- Intervention: THR with ceramic head/insert
- Compare: primary OA hip, conventional metal-on-PE THR
- outcome: as follows

Process of searching

- Keyword:
  - post-traumatic
  - OA
  - THR
  - acetabular fracture
  - ceramic
- Database: PubMed
- Limit
  - Human
  - English
  - 1995-2005

Journal reading

- Total hip arthroplasty after operative treatment of an acetabular fracture

- MARTIN WEBER, DANIEL J. BERRY and W. SCOTT HARMSEN
- *The Journal of Bone and Joint Surgery* 80A:1295-1305 (1998)

Method

- 66 THRs for post-traumatic OA after acetabular fracture s/p ORIF
- loss of contact in 3
- Mean age: 52y/o (19-80 y/o)
- Mean f/u: 9.6yr (2~20 yrs)

Result

- No Revision in 46 pts
  - Mean Harris hip score:49→93
- revision in 17 pts (mean: 9 yrs post-op)
  - aseptic loosening in 16 hips
  - removal of a trochanteric cerclage wire in 1 hip 12 yrs post-op

10-yr survival rate of prosthesis

- Aseptic loosening as the end-point
- Whole prosthesis: 78%
  - Acetabular components: 87%
  - Femoral components: 84%

Risk factors for aseptic loosening

- age<50 *p=0.02*
- BW>80kg *p=0.047*
- Large residual combined segmental and cavitary deficiency *p<0.0001*

Problem 2: Ceramic *vs.* metal

- 古早味: 塑膠（高分子量聚乙烯, high molecular weight polyethylene）做成的杯狀物及一個合金（鈦合金 or 鈷鉻鉬合金等）做成的球狀棒體
  - mechanical failure
  - PE wear induced osteolysis
  - <15yrs survival
- Our pt: 陶瓷頭+陶瓷杯襯墊/合金外罩杯
  - Fracture of ceramic bearing

Ceramic bearing的特色

- 比傳統塑膠更耐磨
  - 陶瓷頭與陶瓷襯的磨損率每年小於0.001mm
  - 一般金屬材質的人工髖關節磨損率是陶瓷材質的200至500倍
- 需自費4萬~11萬 NT$
- **缺點:易碎**
- 陶瓷材質被証實有比較低的骨溶解發生率
- 適合年輕患者
- 免除多次手術的惡夢

Why choose ceramic?

- Our pt: 48y/o→young age
- Owned a metal factory→highly active
- Multiple previous surgeries→fear for revision
- Good socio-economic status

Journal reading:
Fracture of ceramic bearings
History and present status

Clinical Orthopaedics and Related Research
Volume (417), December 2003, pp 19-26

Hannouche, Didier MD; Nich, Christophe MD; Bizot, Pascal MD; Meunier, Alain PhD; Nizard, Remi MD, PhD; Sedel, Laurent MD

From the Hopital Lariboisiere; and Universite Denis Diderot, Paris, France.

Result

- 1977-2001
- 5500 alumina componients implanted
  - 3300 all-alumina bearing
  - 1200 alumina on polyethylene
- 13 fx of alumina component

Result

- 7 female + 6 male
- Mean age 59 y/o
- Mean BW 71 kg
- 8 femoral head + 5 socket
- 3 trauma + 2 abnormal design

Journal reading

Alternative materials to improve total hip replacement tribology

Acta Orthop Scand. 2003 Aug;74(4):380-8.

Santavirta S, Bohler M, Harris WH, Konttinen YT, Lappalainen R, Muratoglu O, Rieker C, Salzer M.

Review article

- highly cross-linked UHMWPE
- aluminum oxide ceramic bearings
- metal-on-metal bearings

highly cross-linked UHMWPE

- Cross-linking 可有效降低 wear resistance
- 在餘命中幾乎不會磨損

Bioinert alumina ceramic (aluminum oxide)

- 30年前發明
- 生物特性穩定→Osteolysis 機率低
- 正確放置的A-on-A bearings
  - annual linear wear rate =3.9 microm
- alumina-on-alumina bearings 優於 Alumina heads combined with polyethylene sockets

- 精確的加工
- 接觸面的幾何設計
- 現有的產品,fracture risk <1 per 1000

metal-on-metal bearings

- 最近又翻紅的傳統材料
- 易於加工磨光
- 現有的產品: 鈷鉻鉬合金 with varying carbon contents→self-polishing 自我打磨
- Linear wear rate: a few micron/year

Overall

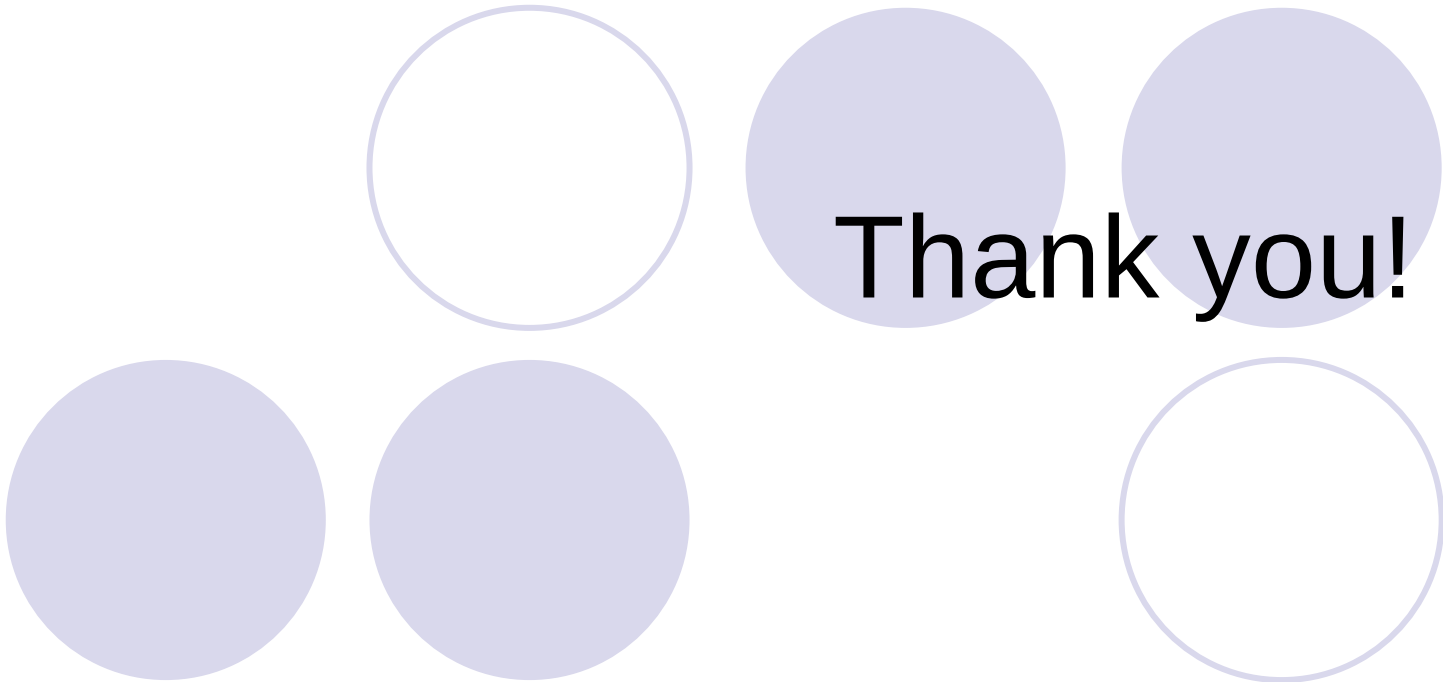
- Improvement in the tribology and longevity of the THR 更了解摩擦學和壽命
- larger head sizes, to reduce the risk of impingement and subluxations

Conclusion

- THR for post-traumatic OA is more technically demanding than THR for primary OA
- Ceramic head is preferred in this younger and active patient who could afford the added cost

Post-op care

- 禁忌姿勢：
  - 髖關節彎曲超過90度
  - 髖關節外旋
- 各種坐姿都必須保持膝關節要低於髖關節，所以可將家中較低的椅子或馬桶座，事先做加高的處理
- 睡覺平躺時，雙大腿間一定要安放一個枕頭，以保持雙腿分開。
- 平躺或坐著時，雙腳不可交叉及向內轉。
- 不可坐著前傾穿鞋襪。
- 避免翹腿及蹲姿。
  勿持續坐超過一小時以上，應常站立，伸展腿部，走幾步等姿勢轉換，預防髖關節攣縮、屈曲。
- 且勿做使髖關節用力的動作，如過度彎腰、提重物、跑、跳。
- 患肢不能承受身體重量，須用拐杖助行三個月。
  駕車與性生活可於六周至三個月後恢復，但不宜屈曲髖部大於九十度。坐車時，患側宜先進入。


Thank you!

Comments

- 此病人發生Post-traumatic OA可能是因爲受傷後拖到第三天才做ORIF,也有可能是因爲那兩根凸出來的釘子一直磨擦刺激關節面,造成軟骨的erosion,第三個可能是avascular necrosis,但術中所見不太像
- 此病人受傷後動了三四次刀,今年七月又動右邊大腿,到九月動左邊髖關節置換,已經被這麼多次的開刀嚇到了,所以主動要求使用較耐磨,較低重置率的陶瓷材質
- 病人術後恢復良好,術後四天就出院了
- 關於姿勢的衛教很重要,此病人雖然在術前就發給小手冊研讀,術後他仍然熊熊忘記而出現翹二郎腿及兩腳交疊的情形,另外也交代家屬把家中的床墊,椅子都換成硬的材質
- 既然是針對左髖骨的問題作討論,右邊股骨骨折的部分可省略不報