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LKS Faculty of Medicine
Department of Orthopaedics & Traumatology
香港大學矯形及創傷外科學系

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HKUMed introduces the latest robotic arm assisted joint replacement technology for enhancing surgical precision

港大醫學院引入嶄新機械臂關節置換技術提升手術精準度

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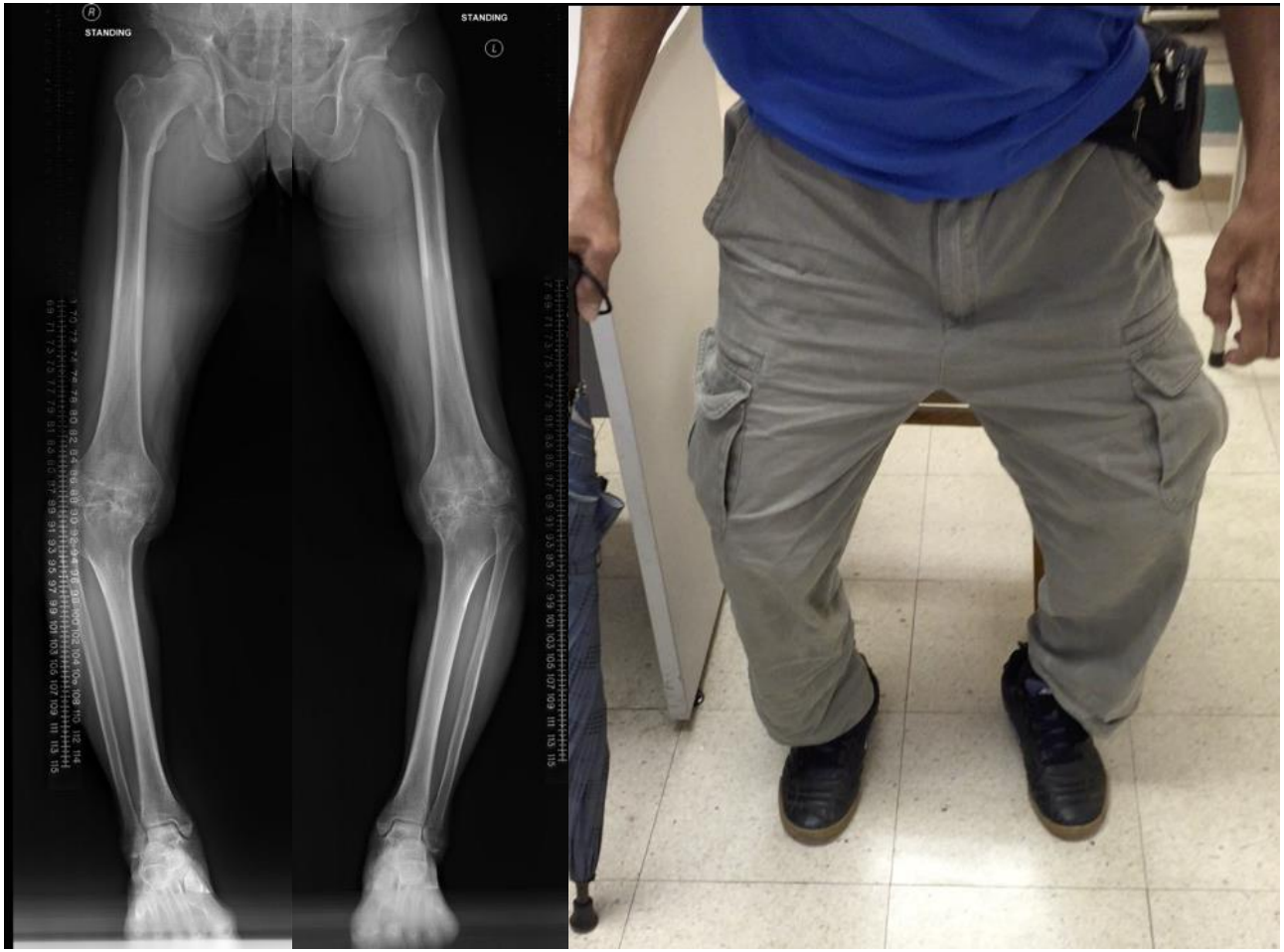
Arthritis
關節炎

- Severe pain
- Stiffness
- Deformity
- Poor function

- 關節疼痛
- 僵硬
- 外觀畸形
- 功能衰退



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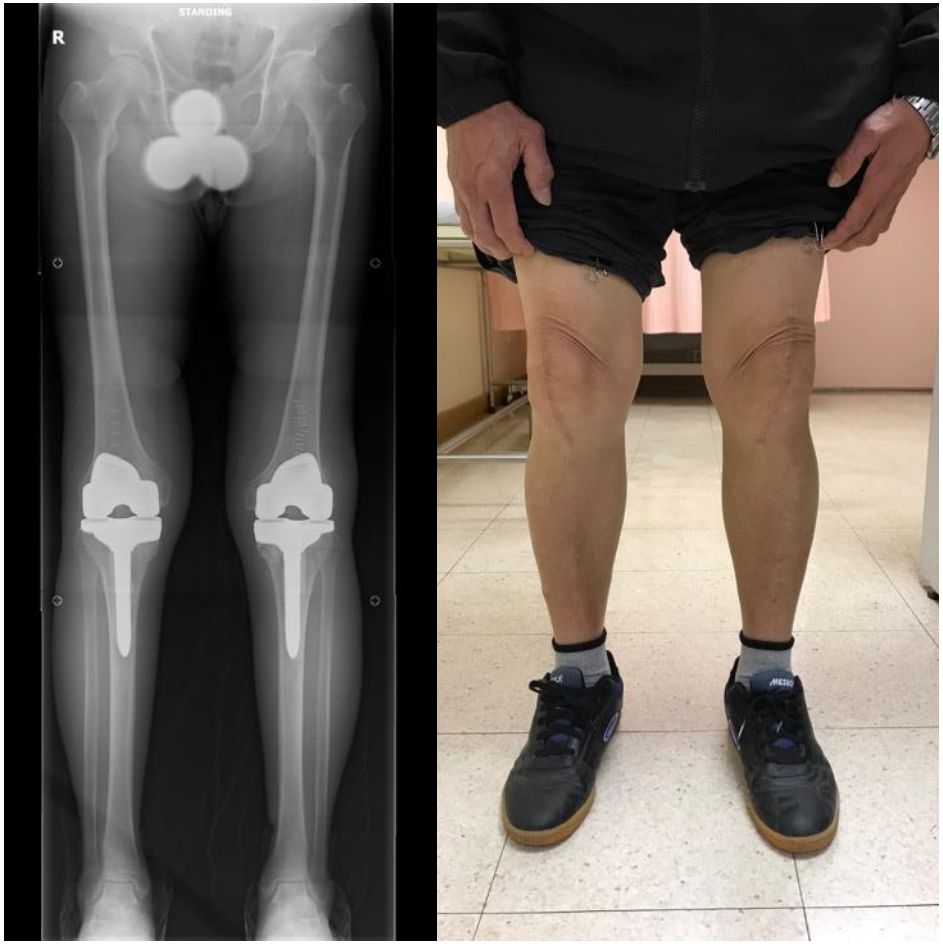
Joint Replacement Surgery
關節置換手術

- Pain relief
- Improve range of motion
- Deformity correction
- Regain function

- 緩解疼痛
- 改善活動度
- 矯形
- 恢復功能



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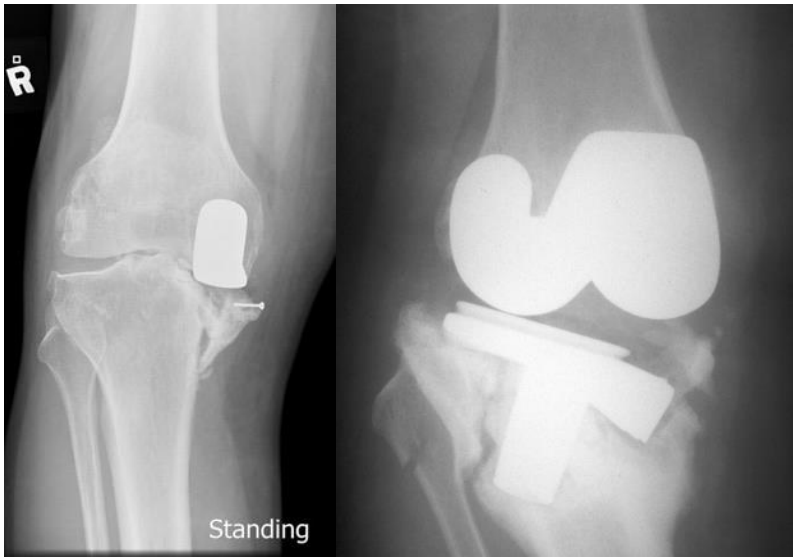
Conventional Surgery
傳統手術

- Dependent on Surgeon's experience
- Risk of error

- 依賴外科醫生的經驗
- 存在出錯的風險



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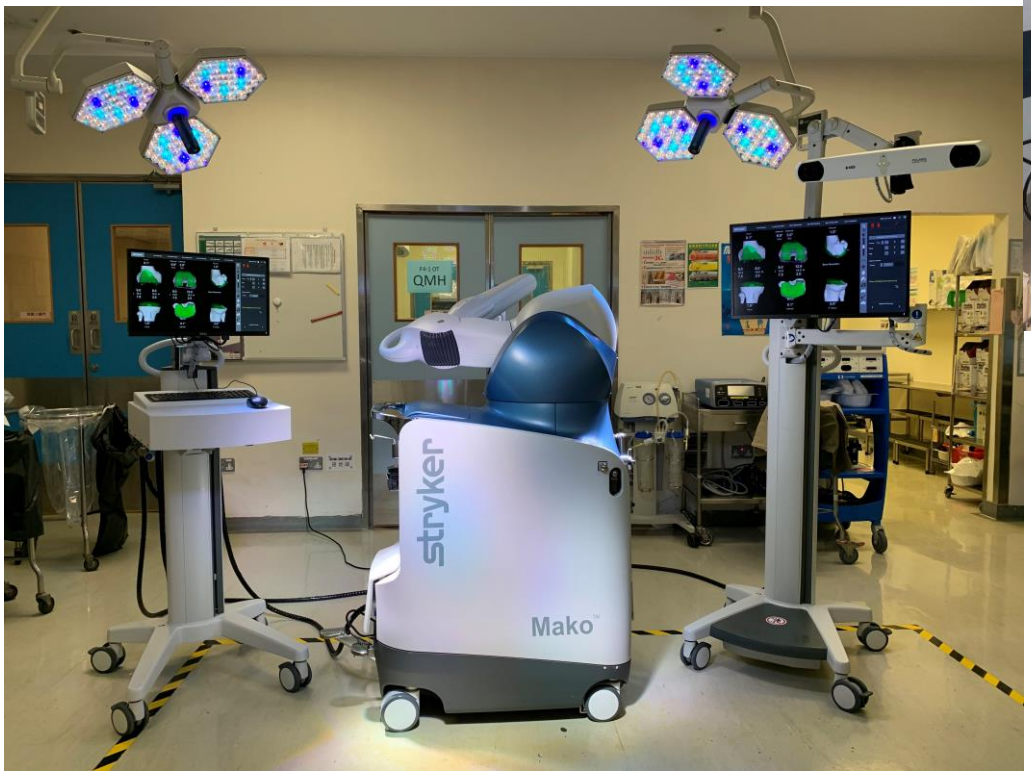
Robotic Arm Surgery
機械臂手術



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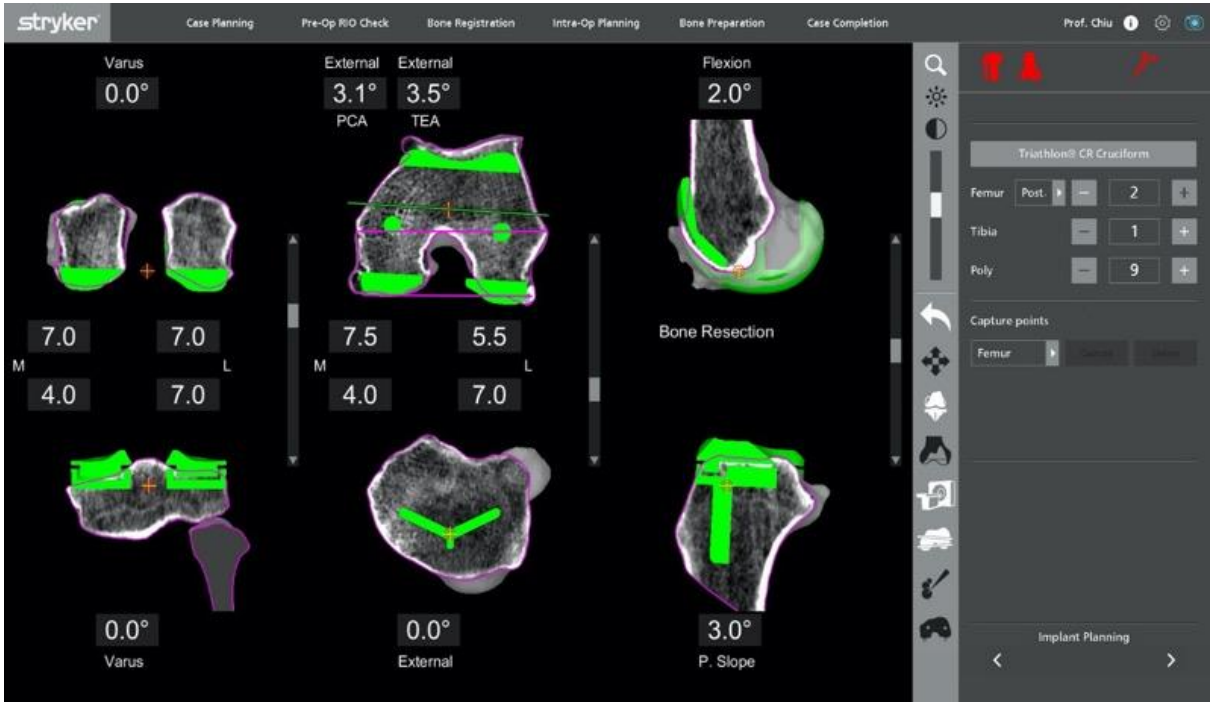
Robotic Arm Surgery
機械臂手術

- Preoperative CT scan for 3D planning
- Patient specific sizing and positioning of implants

- 立體三維電腦掃描作術前計劃
- 個人化的假體尺碼和位置選擇



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Robotic Arm Surgery
機械臂手術

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Robotic Arm Surgery Applications
機械臂手術應用領域

- FDA approved
- 美國食品藥品監督管理局認可

Total Knee Replacement 全膝關節置換術	Partial Knee Replacement 單髁膝關節置換術	Total Hip Replacement 全髖關節置換術
		
73%	15%	12%

Comparison
對照

	Conventional 傳統	Robotic 機械臂
Preoperative planning 術前手術計劃	2D X-rays 平面二維圖像	3D CT scans 三維電腦掃描
Accuracy of implant placement 假體放置準確性	Lower 較低 80% for Total Hip Replacement 全髖關節置換為80%	Higher 較高 98% for Total Hip Replacement 全髖關節置換為98%
Variability 假體放置一致性	Surgeon dependent 取決於外科醫生的經驗	Consistent 一致性高
Safety 安全性	Higher chance of surrounding tissue injury 周邊軟組織損傷的風險較高	Lesser chance of surrounding tissue injury 周邊軟組織損傷的風險較低

Comparison
對照

	Conventional 傳統	Robotic 機械臂
Length of stay 住院時間	Longer 較長	Shorter 較短
Postoperative Pain 術後疼痛	More 較多	Less 較少
Patient Satisfaction 患者滿意度	80% satisfaction 八成滿意	92% satisfaction 九成二滿意
Revision Rates 翻修率	Higher 高 5 year revision rate for conventional partial knee replacement is 7% 單髁膝關節置換 五年內翻修率為7%	Lower 低 5 year revision rate for robotic partial knee replacement is 3% 單髁膝關節置換 五年內翻修率為3%

Early Experience
早期經驗

- Queen Mary Hospital
- 11 Jan 2019- 22 May 2020
- 161 Robotic surgeries completed
  - 79 Total Knee Replacements
  - 35 Partial Knee Replacements
  - 47 Total Hip Replacements
- All patients achieved good rehabilitation progress without major complications

- 瑪麗醫院
- 2019年1月11日至2020年5月22日
- 完成161個機械臂手術
  - 79例全膝關節置換
  - 35例單髁膝關節置換
  - 47例全髖關節置換
- 所有患者康復進展良好，並無重大併發症

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Early Experience
早期經驗

Total Knee Replacement
全膝關節置換術

- Faster recovery
- 84% patients directly discharged home

- 較早功能恢復
- 84%患者可以直接出院

Partial Knee Replacement
單髁膝關節置換術

- Superior joint line restitution
- Shorter learning curve

- 更精準的關節綫修復
- 較短的學習曲綫

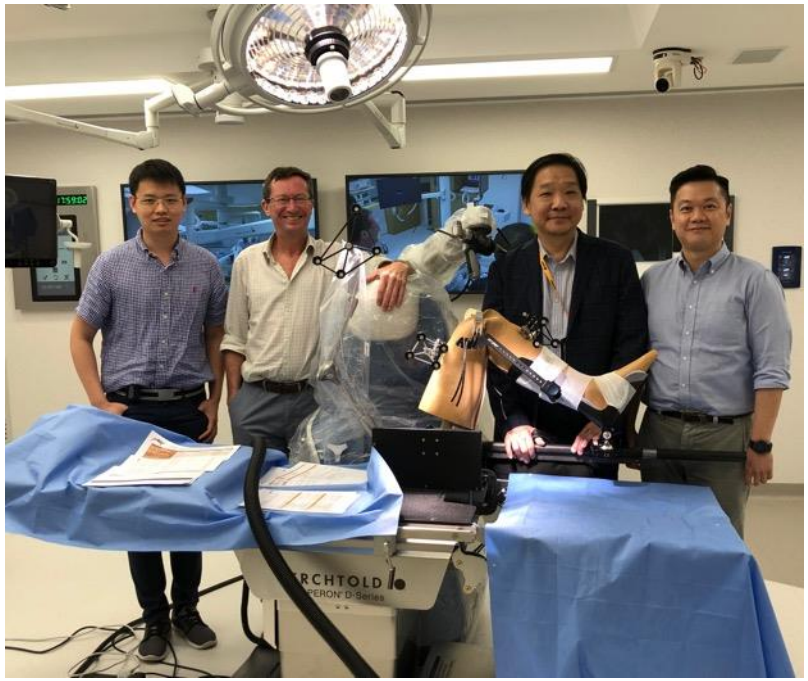
Total Hip Replacement
全髖關節置換術

- 98% achieved desired implant position

- 98%假體放置位理想

Target
目標

- At least 200 robotic joint replacement surgeries/year
  - Severe deformity
  - Primary surgery
  - Younger age group



- 每年至少 200例機械臂關節置換手術
  - 嚴重畸形
  - 初次手術
  - 年齡較輕

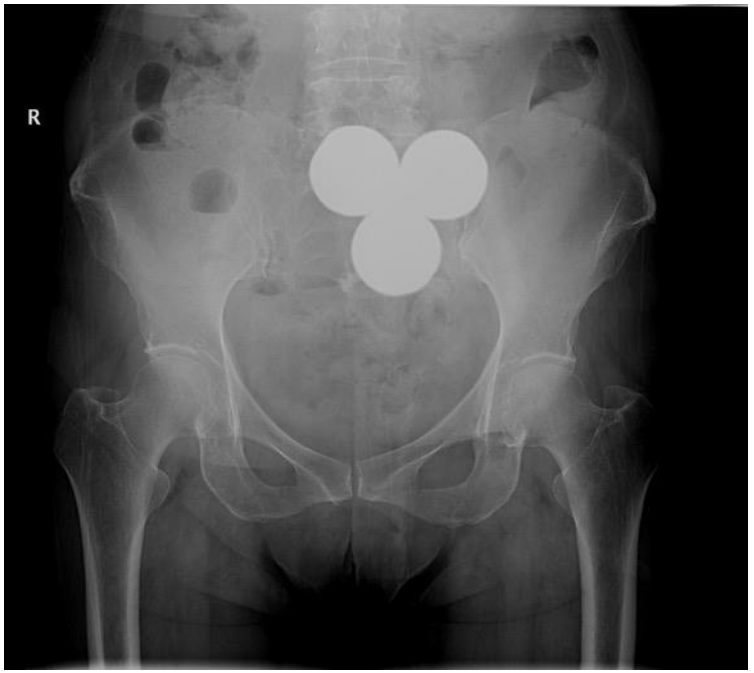
- All 3 Surgeons are Certified Trainers
  - Teaching of local and regional surgeons

- 三人現在均是已獲認證的機械臂關節置換術培訓員
  - 致力培訓本地及區內醫生

Patient Sharing
患者分享

- Pseudoachondroplasia 假性軟骨發育不全症
- Skeletal dysplasia 骨骼發育異常

Hip Dysplasia
髖關節發育不良



Normal Hip Joints
正常髖關節

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Preoperative planning
術前計劃

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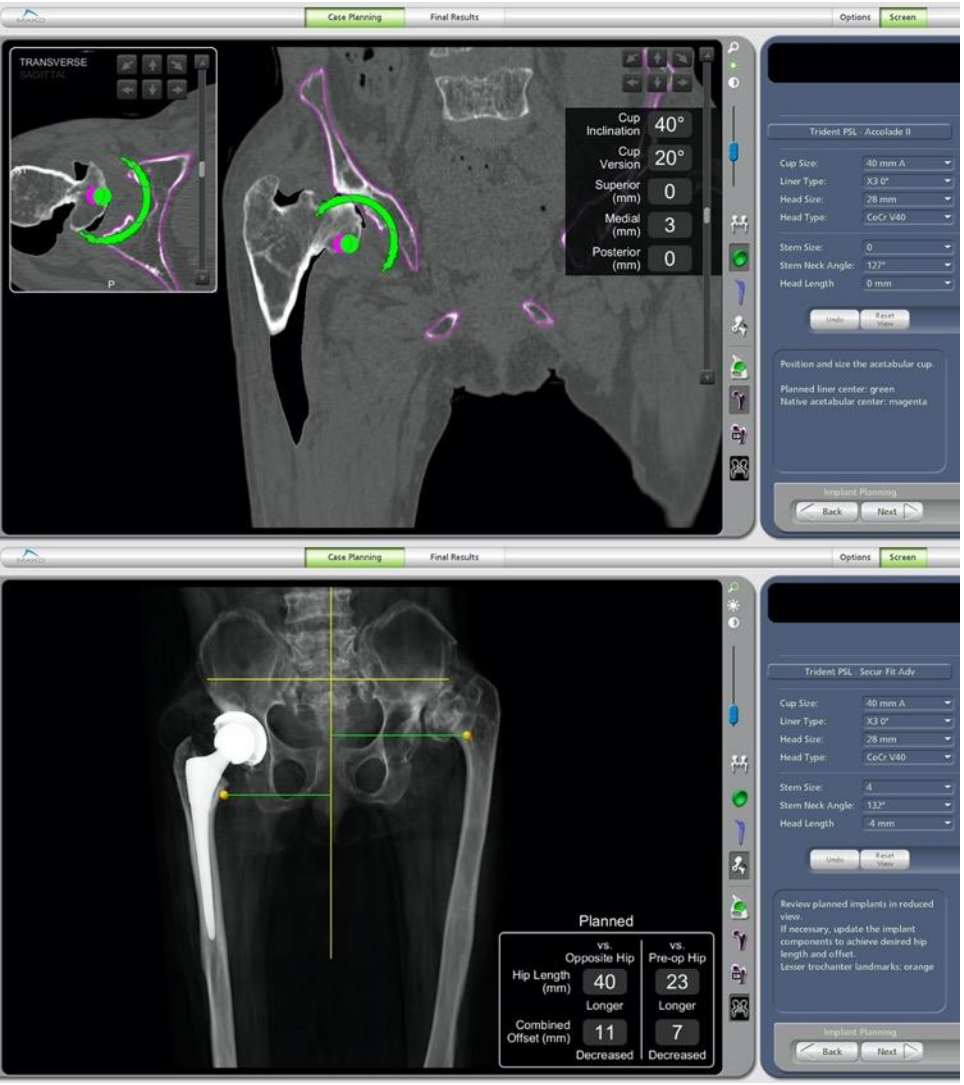
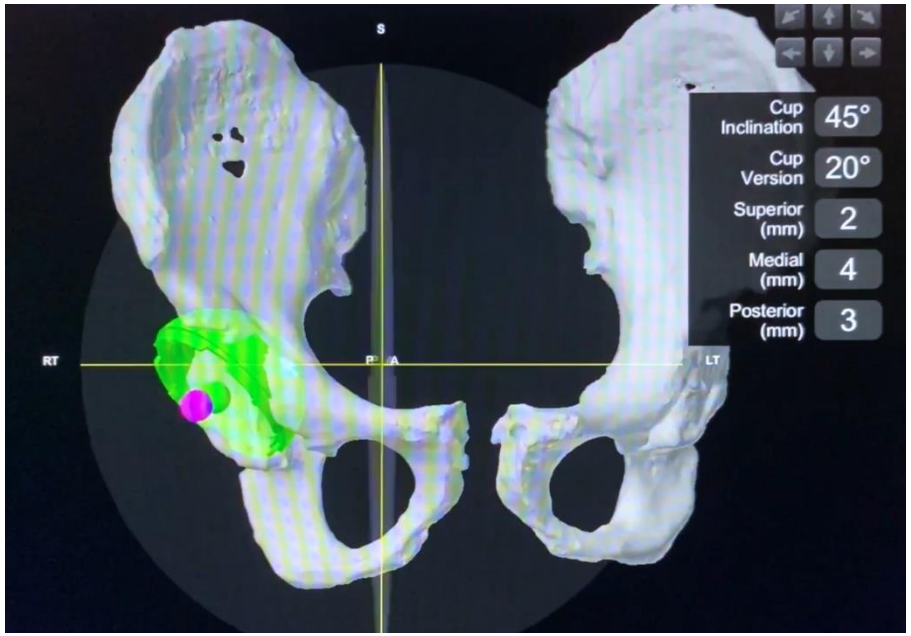
Preoperative planning
術前計劃





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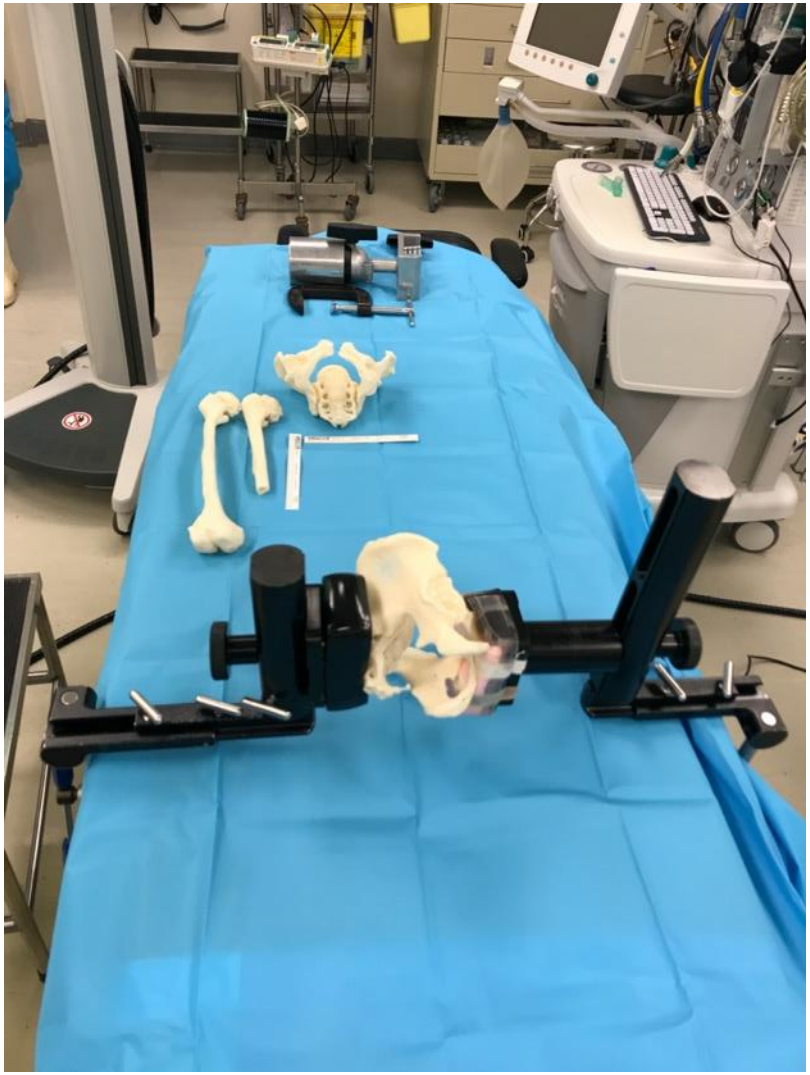
Simulation Surgery
模擬手術



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Intraoperative Progress
手術過程

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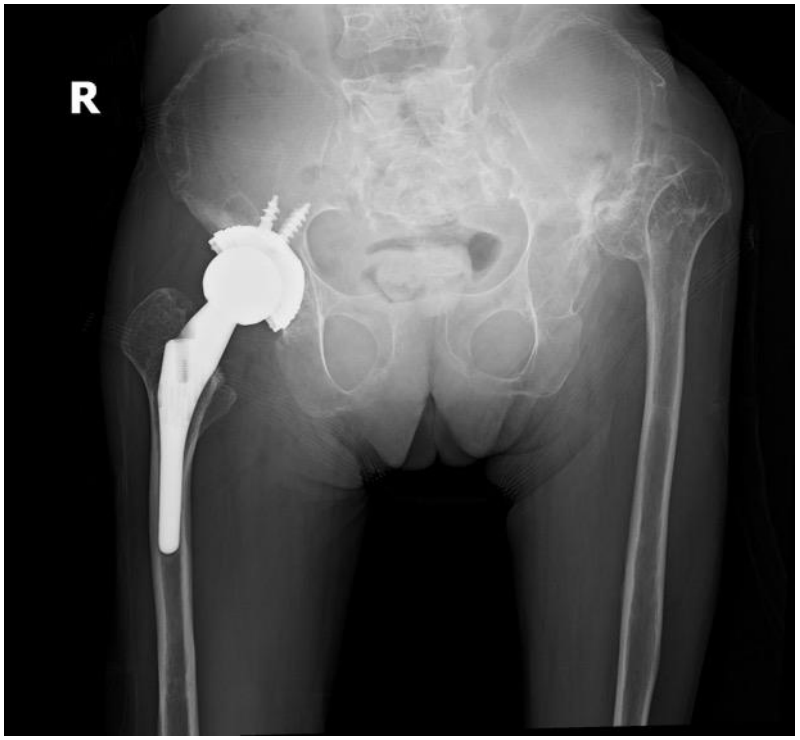
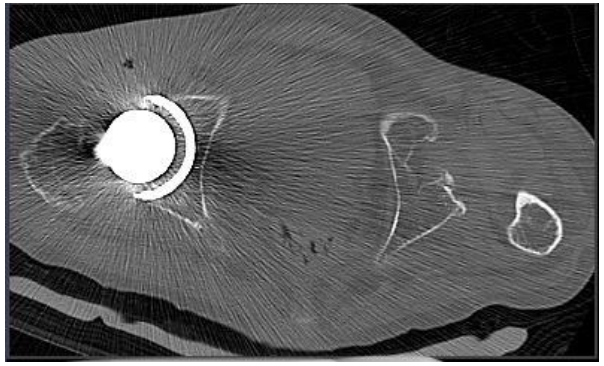
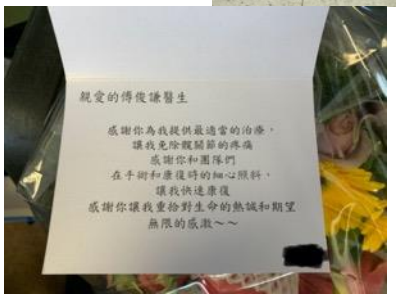
Postoperative Recovery
術後康復





Postoperative 4 months
術後4個月



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Acknowledgement
鳴謝

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Thank you!

謝謝!

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