



# ALLOGRAFT-PROSTHESIS COMPOSITES FOR RECONSTRUCTION AFTER BONE TUMOR RESECTION A CASE REPORT AND LITERATURE REVIEW

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# Case presentation

- 60 years old woman
- Chief complaint: Left hip pain
- History of present illness
  - The patient had suffered from left hip pain 6 months ago, which had not improved with medications
  - On the day before hospitalization, she fell → increasing pain
- Physical examination
  - Pain and swelling around the left hip
  - Shortening of the left leg

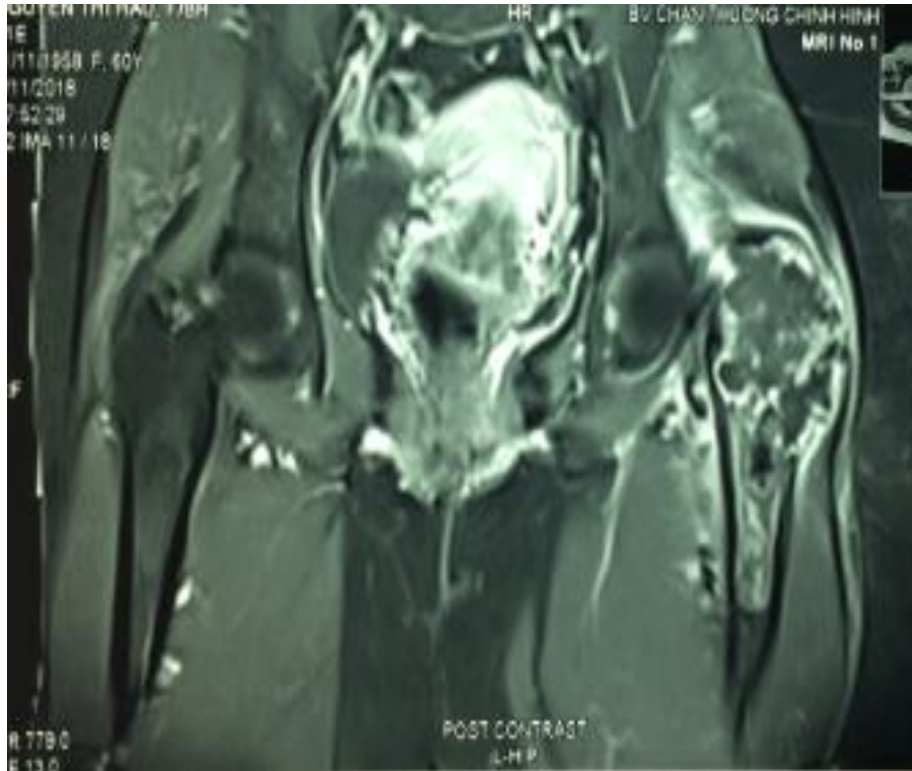


# Imaging

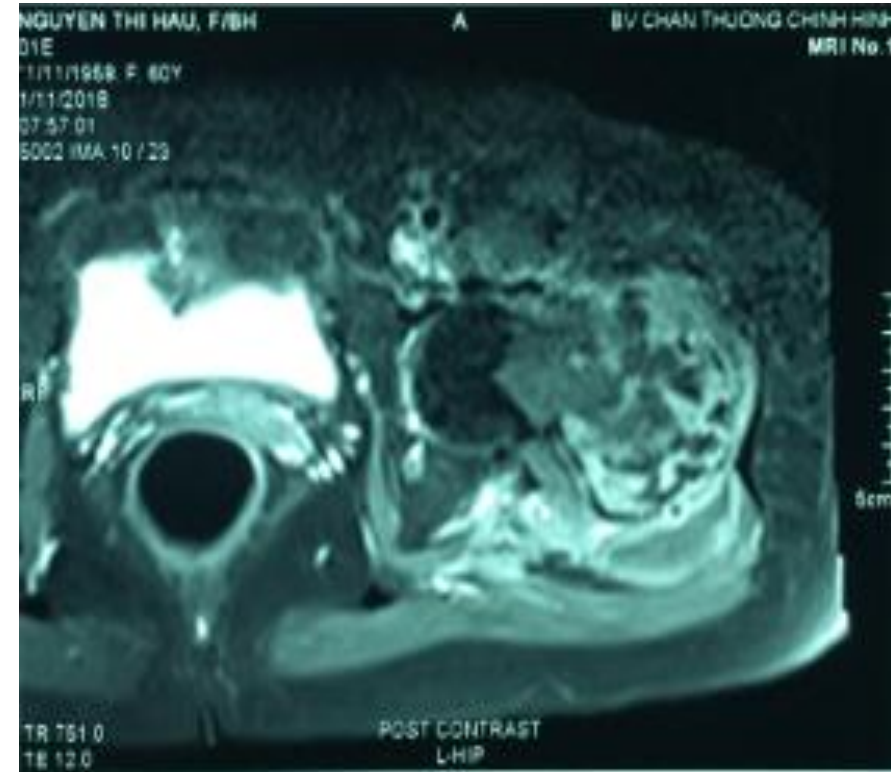


CTscan

# Imaging

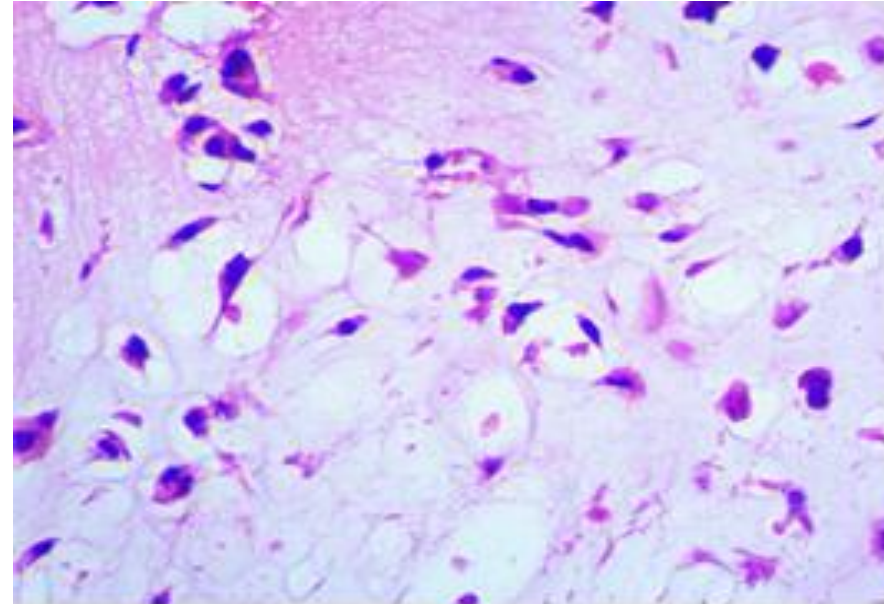
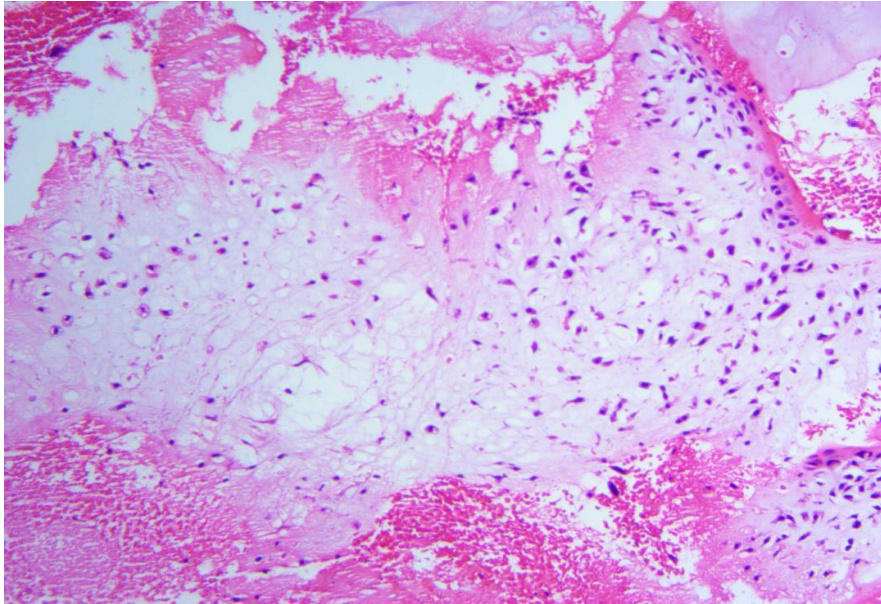


**Coronal -MRI**



**Axial - MRI**

# Pathology



**Pathological diagnosis: Chondrosarcoma**



# Diagnosis

Pathological fracture of Left femoral neck - Chondrosarcoma

# Treatment

Wide resection and reconstruction with Allograft – Prosthesis Composites (APC)



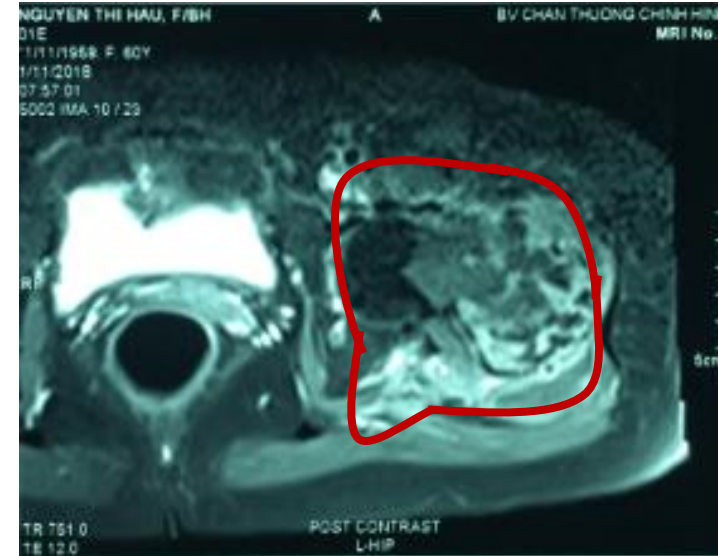
# Preoperative planning

1. Tumor resection
2. Allograft – Prosthesis Composites reconstruction
3. Soft tissue reconstruction



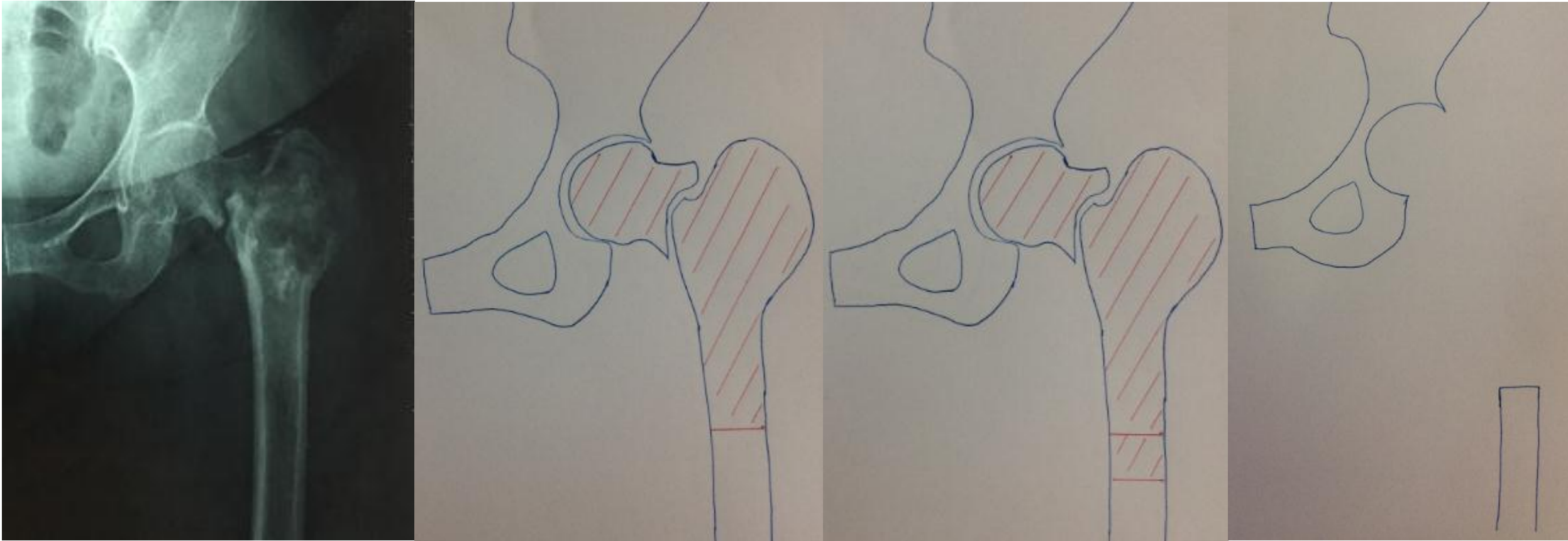
# Preoperative planning - Tumor resection

1. Gluteus Maximus and Medius Detachment
2. Vastus Lateralis Reflection
3. Detachment of Posterior Hip Musculature and Capsule
4. Distal Femur Osteotomy
5. Dislocation of the Femur
6. Release of Medial Structure





# Preoperative planning – APC reconstruction



# Preoperative planning – APC reconstruction

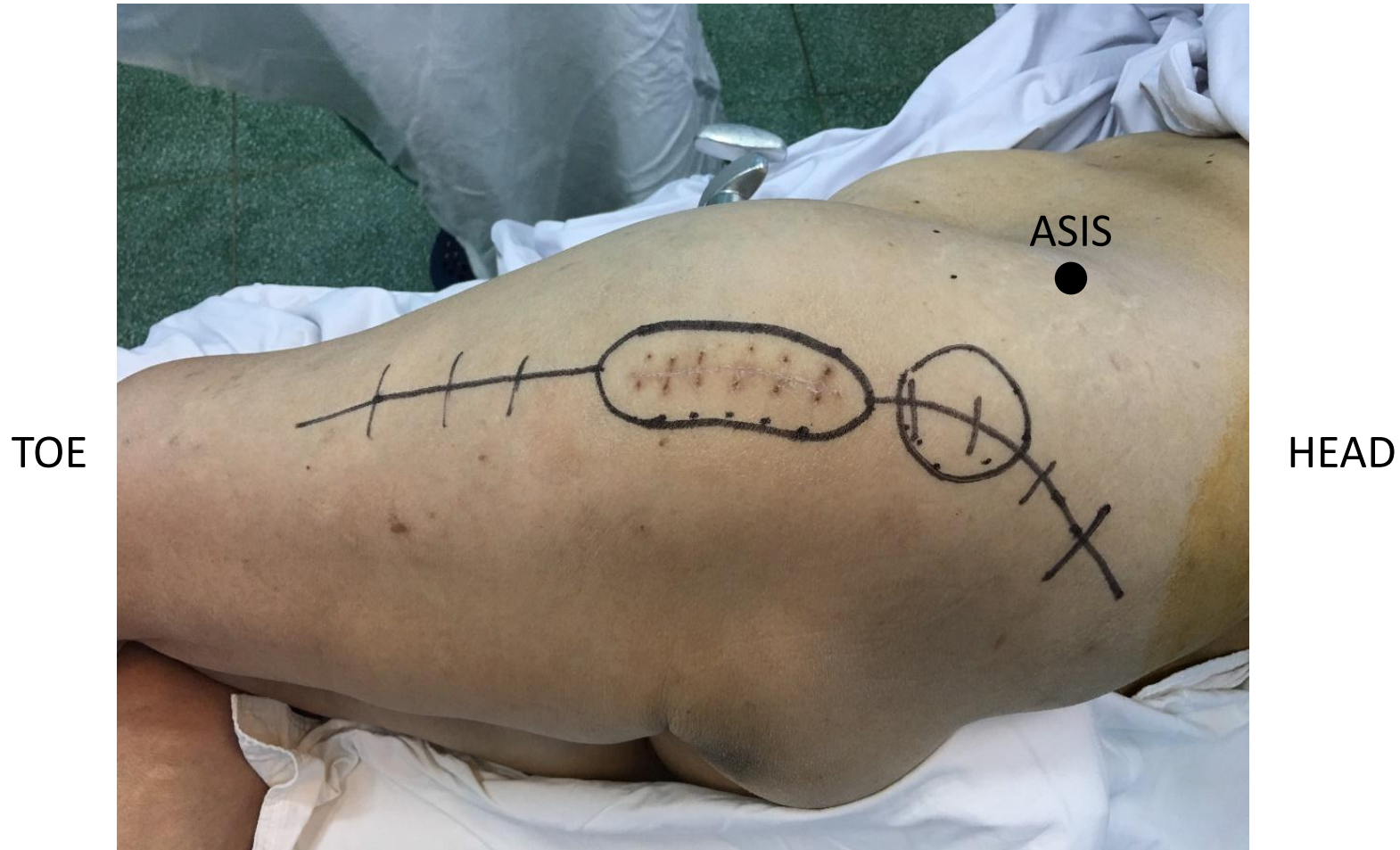


# Preoperative planning – Soft Tissue reconstruction

1. Reconstruction of the Hip Capsule
2. Reconstruction of the Abductor Mechanism and Iliopsoas
  - Gluteus medius
  - Vastus lateralis
  - Iliopsoas

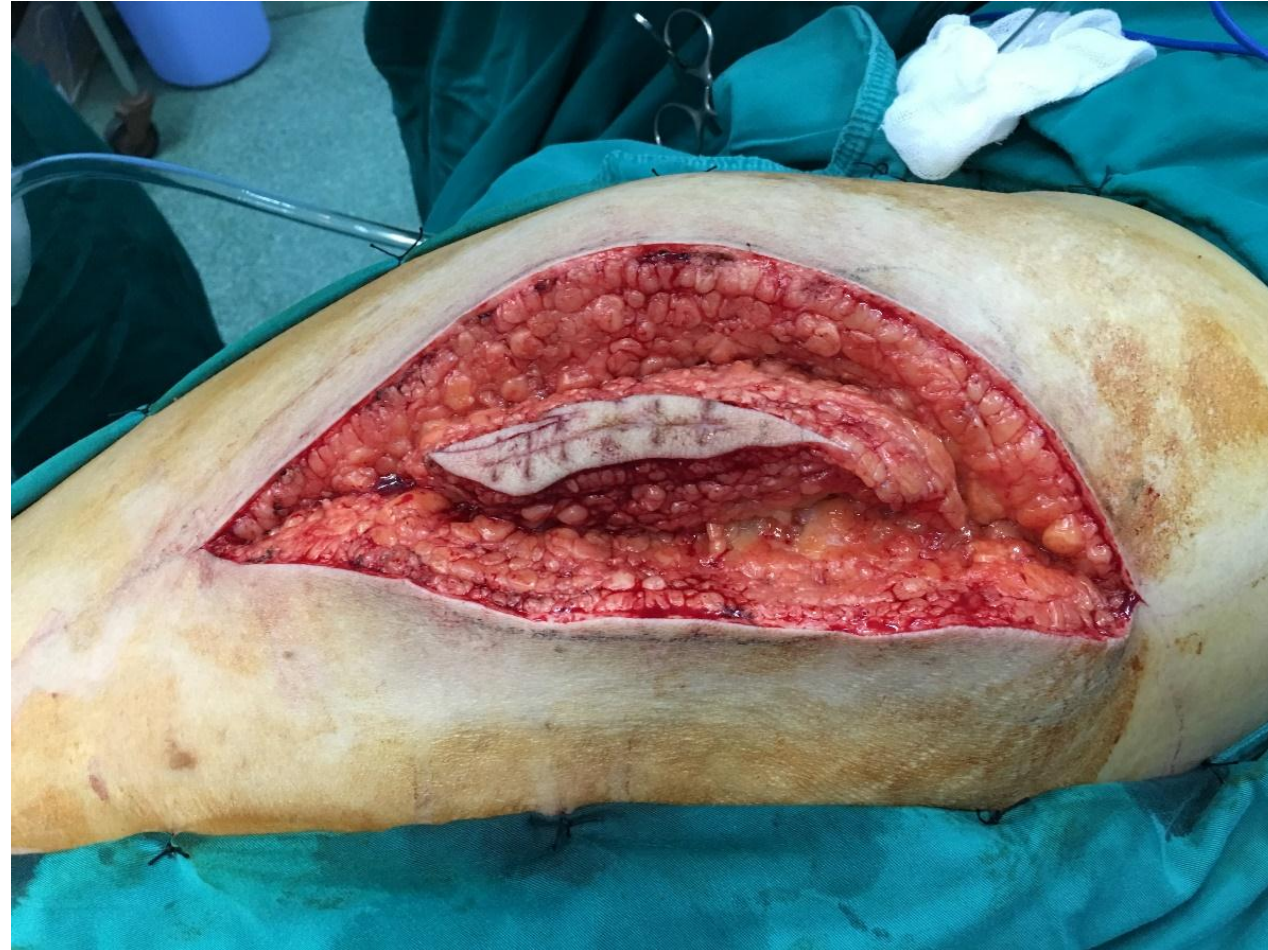


# Intraoperative images



# Intraoperative images

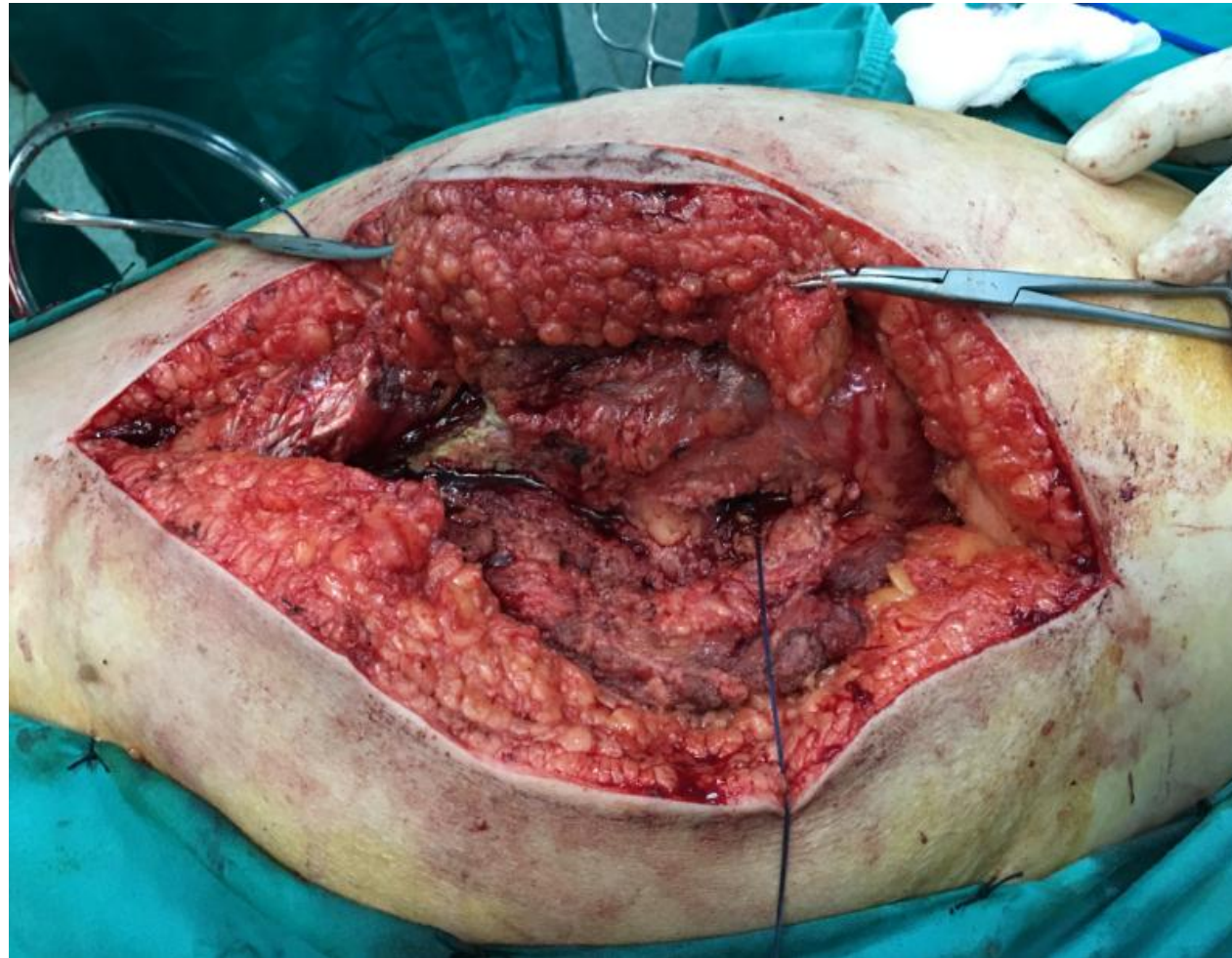
TOE



HEAD



# Intraoperative images



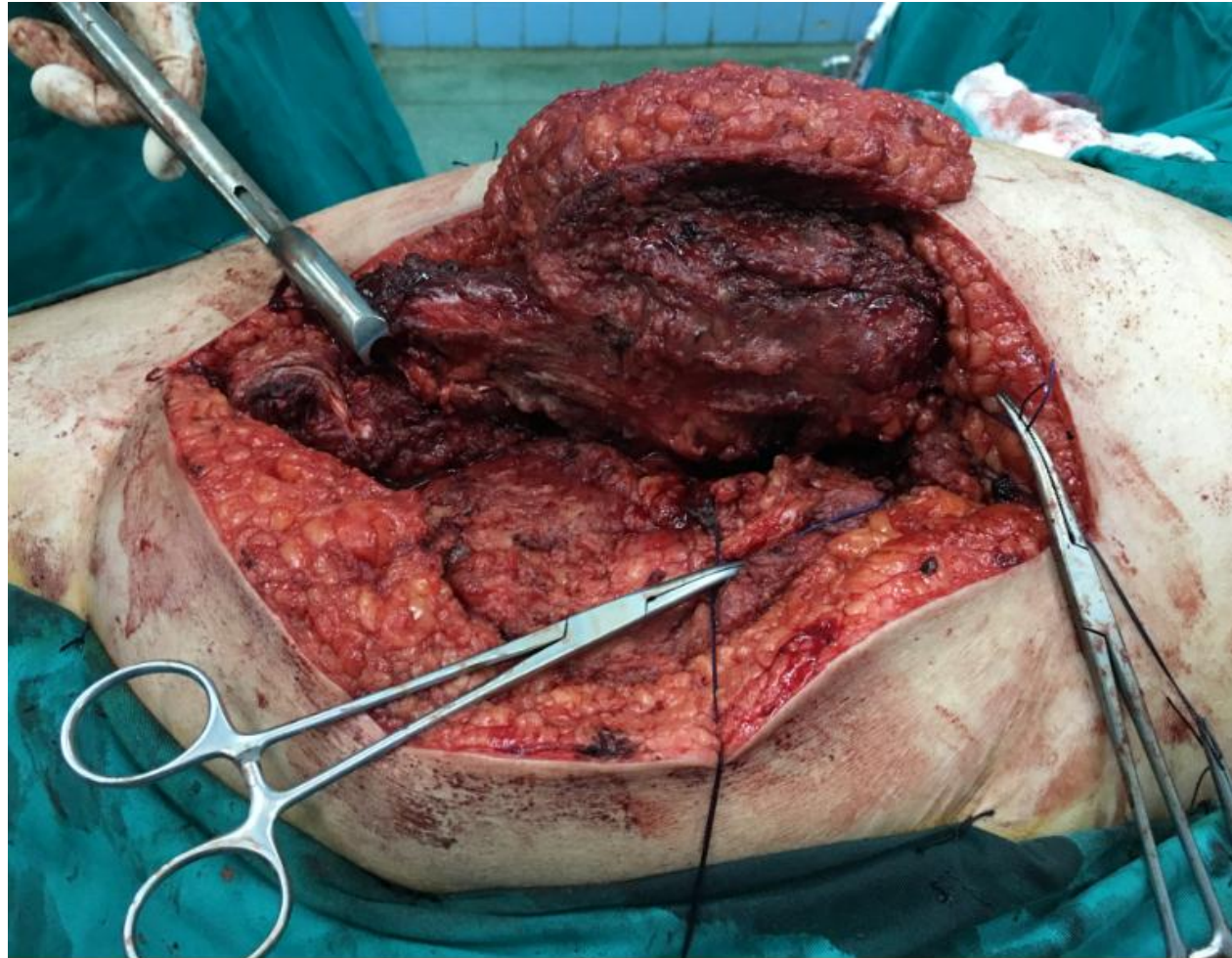
TOE

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# Intraoperative images

TOE



HEAD



# Intraoperative images

TOE



HEAD





# Intraoperative images

TOE



HEAD



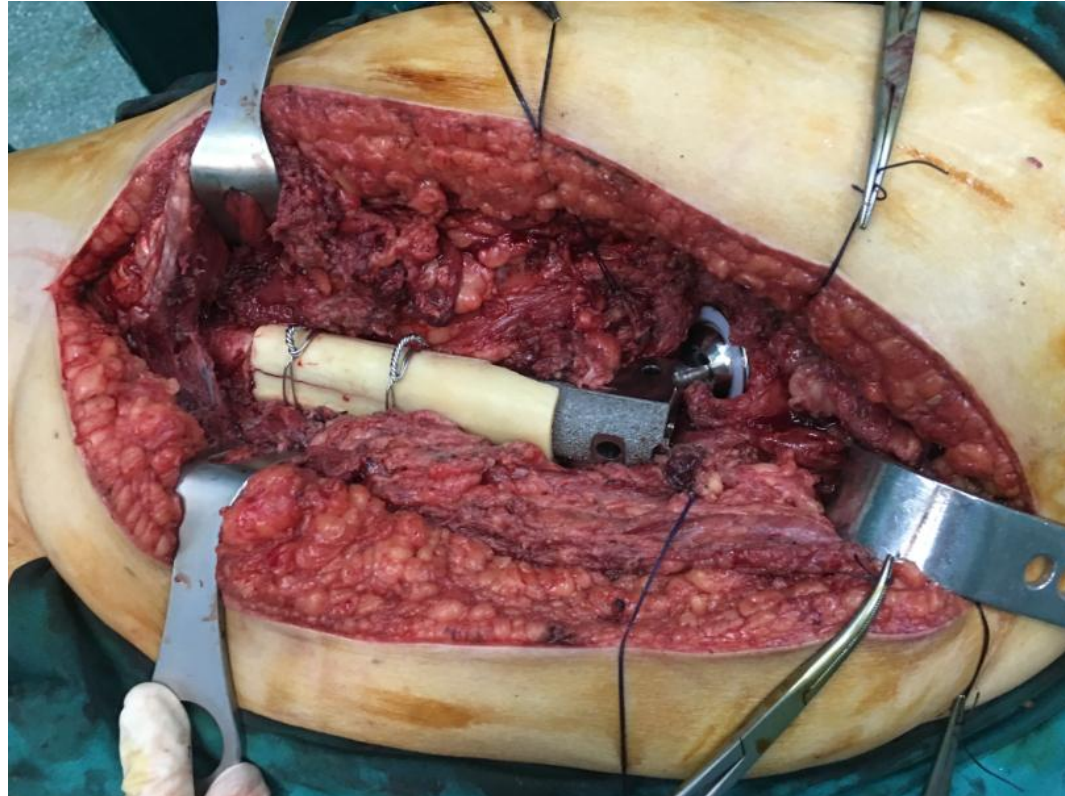
# Intraoperative images



# Intraoperative images



# Intraoperative images



# Postoperative imaging



**Post-Op**



6 months FU



6 months FU

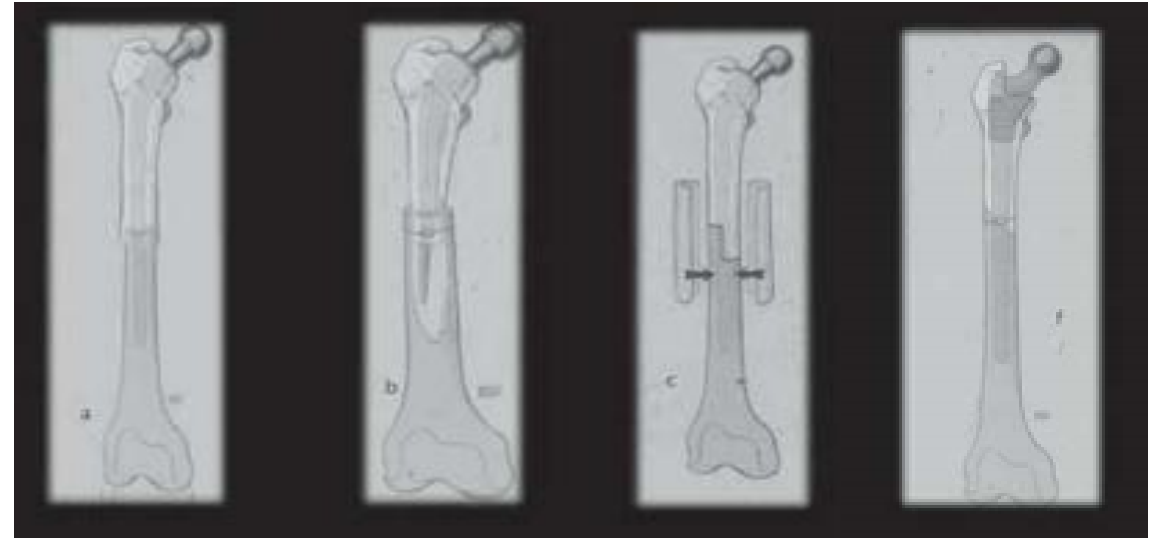


# 6 months FU



# Discussion – Stability

- Femoral Osteotomy
- Cementing
- Reaming
- Stem length



**A: Transverse. B: Intussuception. C: Step cut. D: Oblique** <sup>1</sup>

1. Sim, F. H., Choong, P. F., & Weber, K. L. (2011). *Master Techniques in Orthopaedic Surgery: Orthopaedic Oncology and Complex Reconstruction*. Lippincott Williams & Wilkins.

2. Min, L., Peng, J., Duan, H., Zhang, W., Zhou, Y., & Tu, C. (2014). Uncemented allograft–prosthetic composite reconstruction of the proximal femur. *Indian journal of orthopaedics*, 48(3), 289.



# Discussion – Stability

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- A: Cemented**
- B: Partially cemented**
- C: Cementless**

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Symposium - Osteosarcoma



## Uncemented allograft–prosthetic composite reconstruction of the proximal femur

*Li Min, Jing Peng, Hong Duan, Wenli Zhang, Yong Zhou, Chongqi Tu*

1. The diameter of reaming can be a little smaller than that of the prosthetic stem
2. The host bone should be reamed 2 cm shorter than the length of the distal prosthetic stem <sup>2</sup>

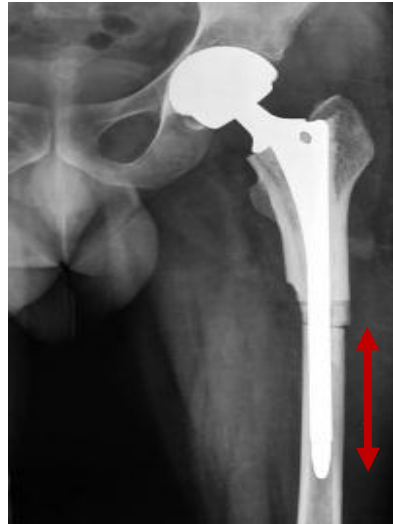
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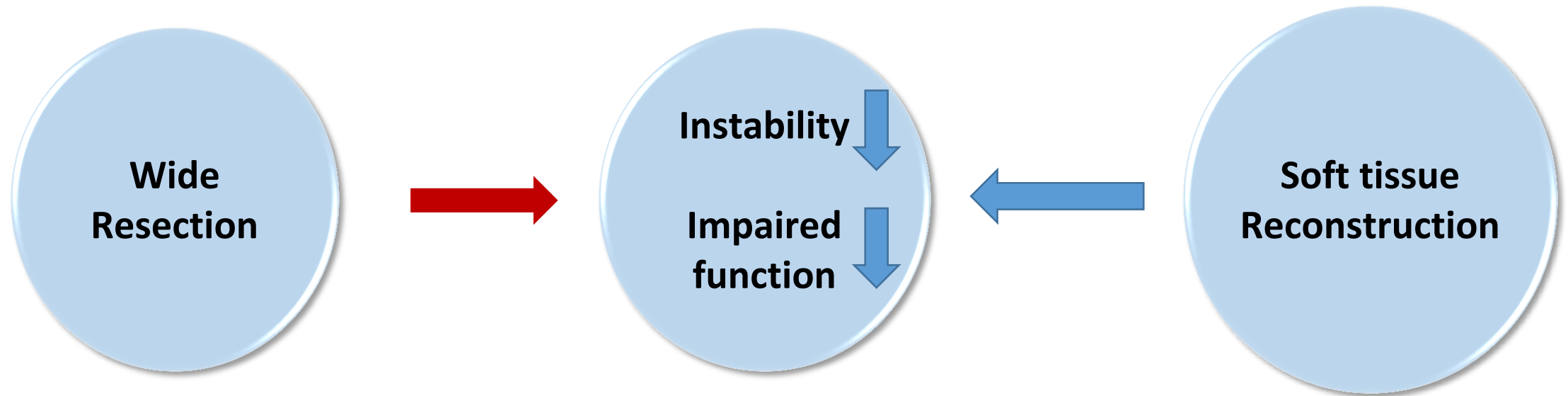


Press fit is considered to be safe when there is at least 6 cm of prosthesis-shaft contact bypassing the allograft host junction <sup>1</sup>

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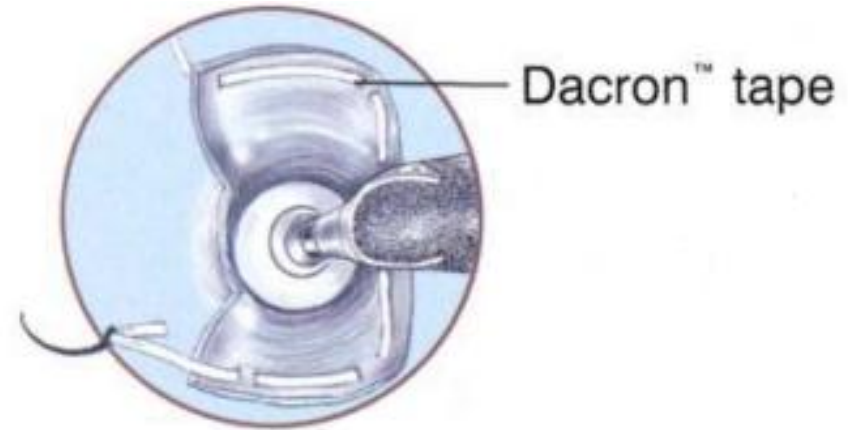
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# Discussion – Soft tissue reconstruction



# Discussion – Soft tissue reconstruction

1. Reconstruction of the Hip Capsule
2. Reconstruction of the Abductors & Iliopsoas
  - Gluteus medius
  - Vastus lateralis
  - Iliopsoas

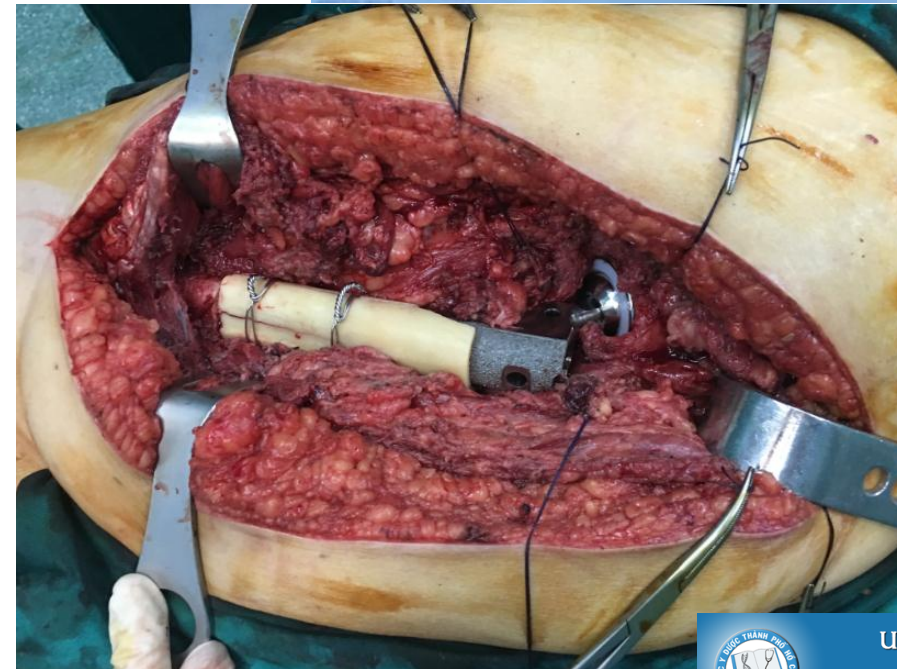
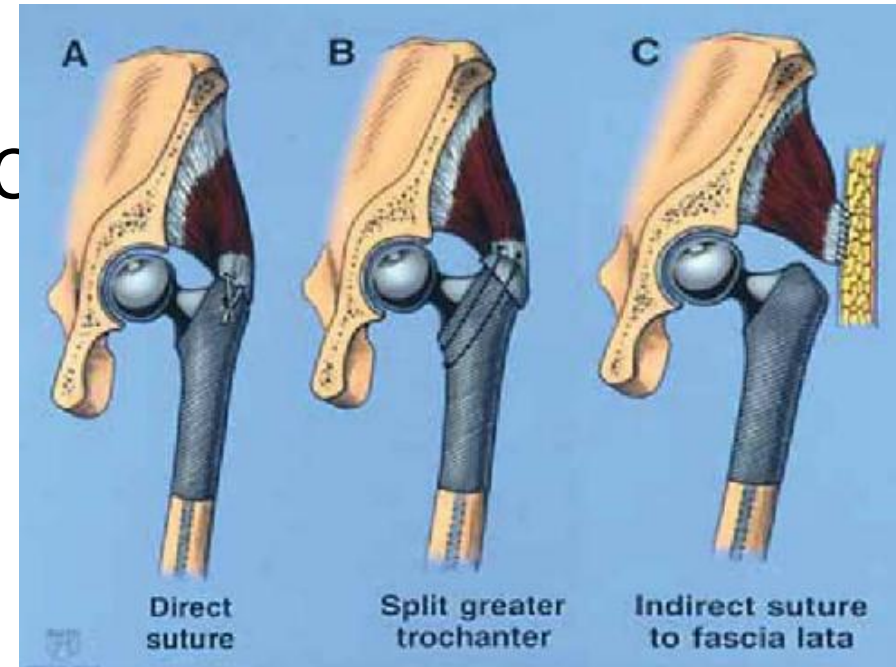


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# Discussion – Soft tissue reconstruction

1. Reconstruction of the Hip Capsule
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  - Vastus lateralis
  - Iliopsoas
2. Reconstruction of the Abductors & Iliopsoas

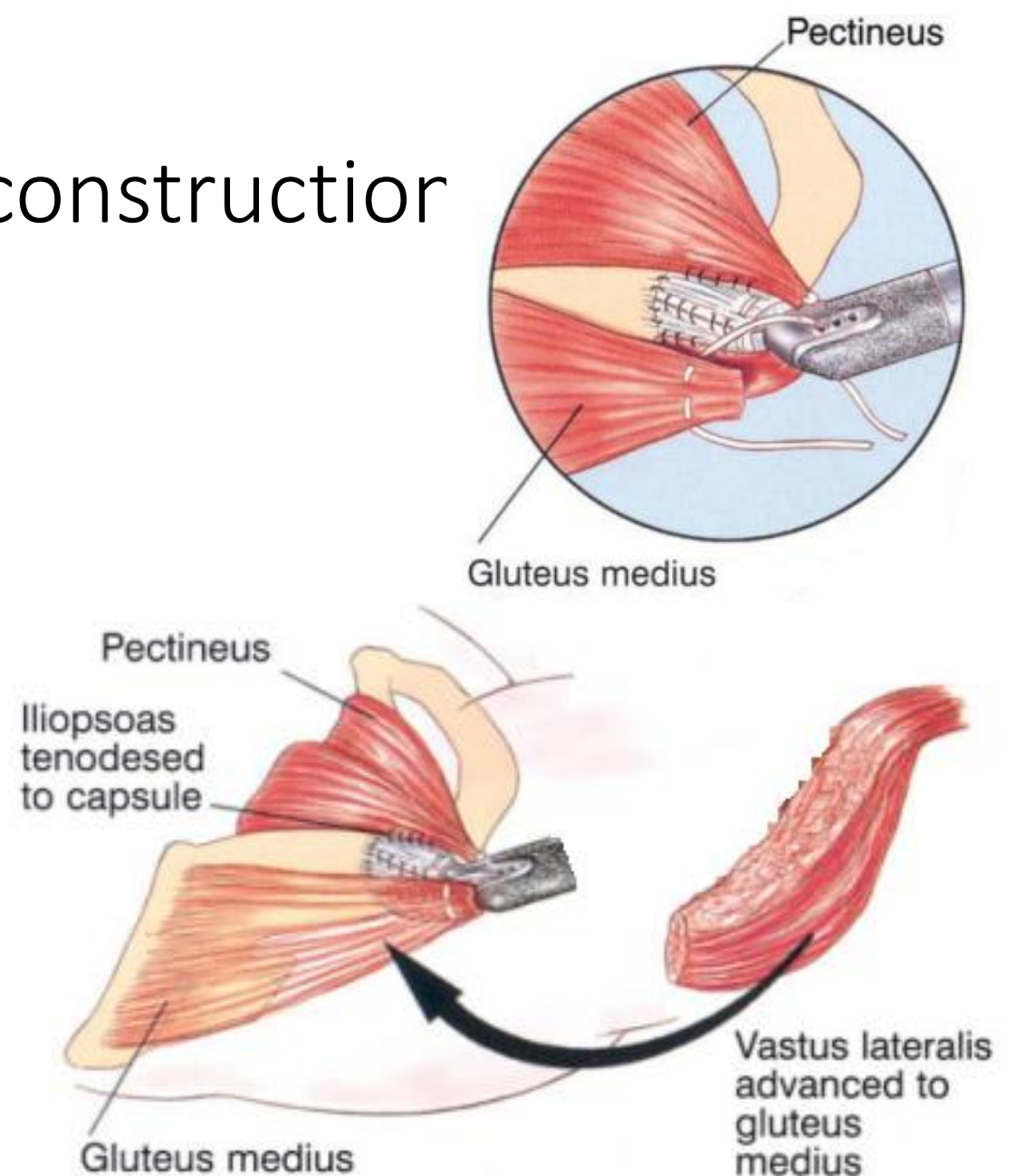


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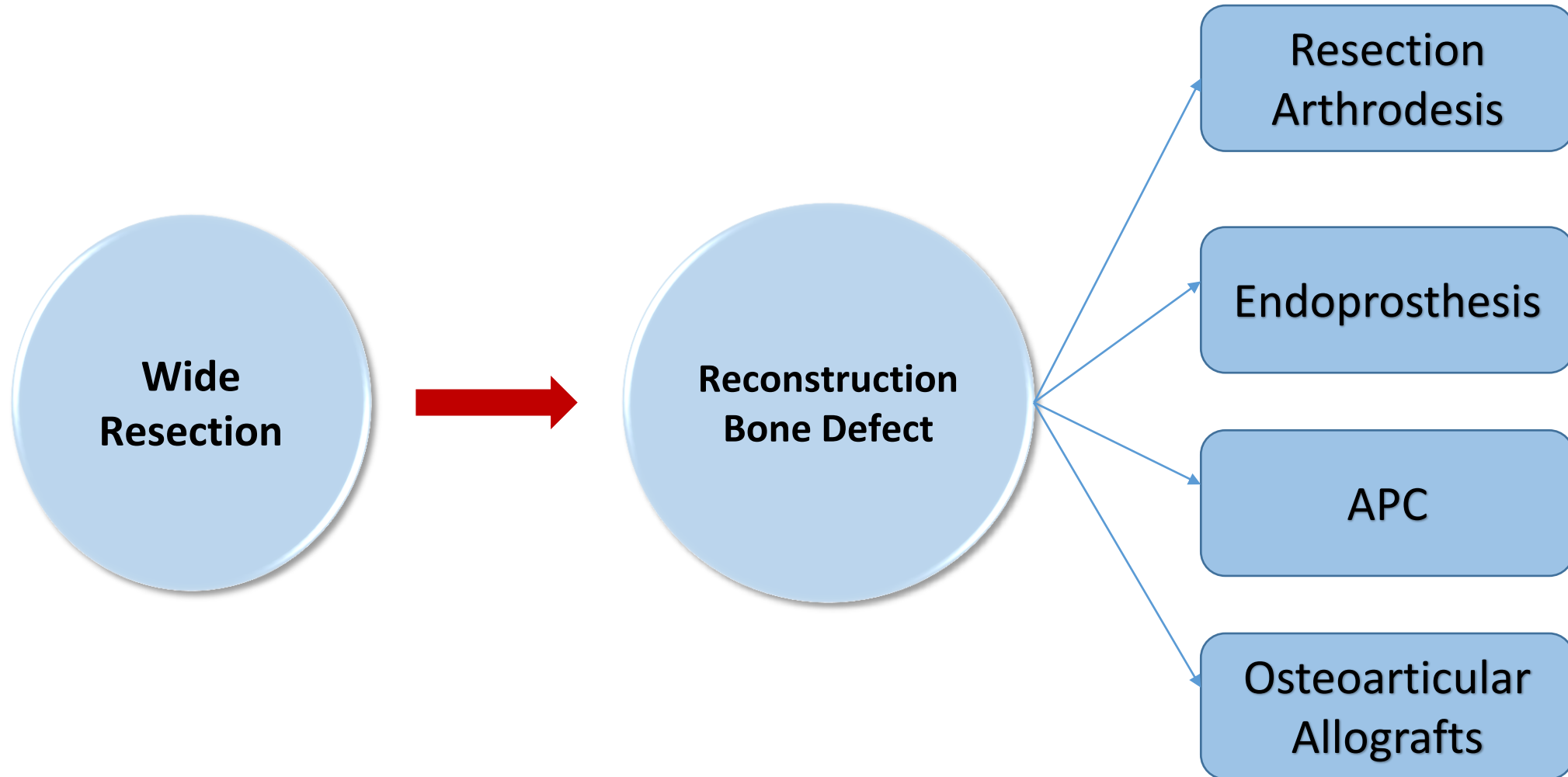
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# Discussion – Megaprostheses VS APC



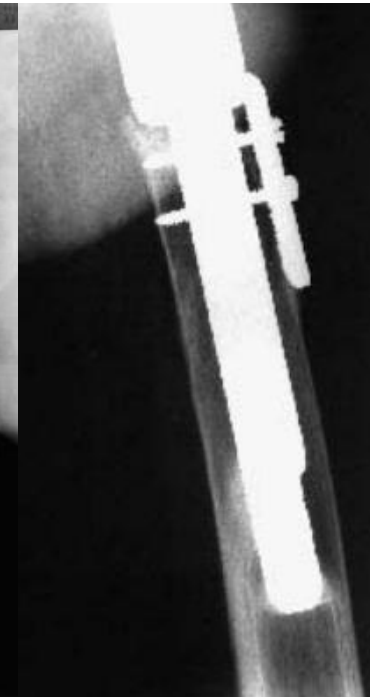


# Discussion – Megaprostheses

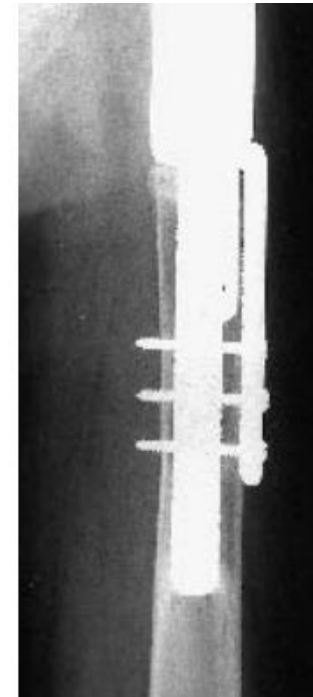
	No of patients	Average FU	Complications
Ilyas <sup>1</sup>	15	78 ms	2 infections, 3 dislocations
Ueda <sup>2</sup>	25	163 ms	8 infections, 4 dislocations
Donati <sup>3</sup>	25	12 ys	1 infections, 17 stress shielding



**Dislocation**



**Stress shielding**



1. Ilyas I, Pant R, Kurar A, Moreau PG, Younge DA. Modular megaprosthesis for proximal femoral tumors. *Int Orthop.* 2002;26(3):170–173
2. Ueda T, Kakunaga S, Takenaka S, Araki N, Yoshikawa H. Constrained total hip megaprosthesis for primary periacetabular tumors. *Clin Orthop Relat Res.* 2013;471(3):741–749. doi:10.1007/s11999-012-2625-8.
3. Donati D, Zavatta M, Gozzi E, Giacomini S, Campanacci L, Mercuri M. Modular prosthetic replacement of the proximal femur after resection of a bone tumour a long-term follow-up. *J Bone Joint Surg Br.* 2001;83(8):1156–1160.



# Discussion – APC

	No of patients	Average FU	Complications
Biau <sup>1</sup>	18	83 ms	4 infections, 1 loosening
Eid <sup>2</sup>	18	93 ms	2 infections, 1 loosening
Langlias <sup>3</sup>	21	10 ys	4 loosening



**Loosening**

1. Biau DJ, Davis A, Vastel L, Tomeno B, Anract P. Function, disability, and health-related quality of life after allograft-prosthesis composite reconstructions of the proximal femur. *J Surg Oncol.* 2008;97(3):210–215.
2. Eid AS, Jeon DG, Song WS, Lee SY, Cho WH. Pasteurized autograft-prosthesis composite for proximal femoral reconstruction: an alternative to allograft composite. *Arch Orthop Trauma Surg.* 2011;131(6):729–737.
3. Langlais F, Lambotte JC, Collin P, Thomazeau H. Long-term results of allograft composite total hip prostheses for tumors. *Clin Orthop Relat Res.* 2003;414:197–211.



# Discussion – Megaprostheses VS APC

	<b>Megaprostheses</b>	<b>APC</b>
Advantages	Easy to reconstruct	Restore bone stock
	Immediate weight bearing	
Disadvantages	Dislocation	Loosening
	Revision difficulty	Nonunion



# Conclusion

- A stable allograft-host junction is essential
- Soft tissue reconstruction is important for good functional outcome
- Allograft Prosthesis Composites (APC) should be a limb salvage procedure of choice in cases with good life expectancy

