

A Unique Presentation of Avascular Necrosis of the Knee after Gastric Bypass: A Case Report

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Case Description

- The patient is a 41-year-old man with morbid obesity who underwent gastric sleeve procedure
- Subsequently developed thrombosis of the SMA with ischemic bowel requiring multiple surgeries.
- Medical course was complicated by thrombosis of his upper and lower extremities, sepsis, respiratory failure requiring intubation, renal failure requiring dialysis, heparin induced thrombocytopenia, portal vein thrombosis, pulmonary embolism requiring Warfarin and IVC filter.
- After discharge, patient continued to have limitation of his activities of daily living as he developed right lower extremity pain about the right knee area – above and below - to the point he could not walk 50 ft without sitting.
- Pertinent physical exam findings showed right lower limb strength 4/5 to hip flexor, 4+/-5 to DF, KE, HE, KF, normal sensation,
- Negative Lachman and anterior/posterior drawer testing

Right Knee MRI



Discussion

- Osteonecrosis or AVN can be differentiated into 2 main categories 1. Primary or 2. Secondary
- Primary occurs spontaneously in the elderly and secondary is due to other factors such as SLE, Caisson decompression sickness or hemoglobinopathies.
- AVN of the knee is a painful entity that occurs when the blood supply is disrupted.
- AVN of the knee is most often seen in the medial femoral condyle and less often in the lateral femoral condyle or the tibial plateau.
- AVN is a difficult diagnosis early on as XRAYs may not identify the lesions.
- Advanced imaging modalities, such as MRI or CT usually are required based on clinical suspicion.

MRI and EMG/NCS

- Right knee MRI: scattered areas of osteonecrosis of the distal femur and proximal tibia suggestive of avascular osteonecrosis.
- Superficial cartilage fibrillation of the patellofemoral compartment (grade 1). Superficial articular cartilage fibrillation of the medial lateral knee compartments, slightly greater in the medial compartment. No osteochondral lesions.
- Small joint effusion.
- NCS/EMG: Evidence of absent sural sensory response and low amplitude peroneal response suggests injury to the sciatic nerve vs more proximal lumbar plexus subacute . Normal needle EMG findings suggests improvement and no axonal involvement suggesting good prognosis for further spontaneous recovery

NCS/EMG Summary

Nerve Conduction Studies
Anti Sensory Summary Table

Stim Site	NR	Peak (ms)	Norm Peak (ms)	P-T Amp (µV)	Norm P-T Amp	Site1	Site2	Delta-P (ms)	Dist (cm)	Vel (m/s)	Norm Vel (m/s)
Left Sural Anti Sensory (Lat Mall)											
Calf 14cm	NR		<4.0		>5.0	Calf 14cm	Lat Mall		14.0		>41
Site 2	NR										

Motor Summary Table

Stim Site	NR	Onset (ms)	Norm Onset (ms)	O-P Amp (mV)	Norm O-P Amp	Site1	Site2	Delta-0 (ms)	Dist (cm)	Vel (m/s)	Norm Vel (m/s)
Left Peroneal Motor (Ext Dig Brev)											
Ankle		8.7	<6.1	1.1	>2.0	B Fib	Ankle	10.4	31.0	30	>40
B Fib		19.1		0.6		Poplit	B Fib	2.9	10.0	34	>40
Poplit		22.0		0.4							
Left Tibial AH Motor (Abd Hall Brev)											
Ankle		4.1	<6.1	12.4	>3.0	Knee	Ankle	7.8	31.0	40	>40
8cm							8cm				
Knee		11.9		8.4							

EMG

Side	Muscle	Nerve	Root	Ins Act	Fibs	Psw	Amp	Dur	Poly	Recrt	Int Pat	Comment
Left	Semimembranosus	Sciatic	L5-S2	Nml	Nml	Nml	Nml	0		Nml	Nml	
Left	PostTibialis	Tibial	L5-S1	Nml	Nml	Nml	Nml	0		Nml	Nml	
Left	Lumbo Parasp Mid	Rami	L3-4	Nml	Nml	Nml	Nml	0		Nml	Nml	
Left	VastusMed	Femoral	L2-4	Nml	Nml	Nml	Nml	0		Nml	Nml	
Left	AntTibialis	Dp Sr	L4-5	Nml	Nml	Nml	Nml	0		Nml	Nml	
Left	Gastroc	Peron Tibial	S1-2	Nml	Nml	Nml	Nml	0		Nml	Nml	

Nerve Conduction Studies
Anti Sensory Left/Right Comparison

Stim Site	L Lat (ms)	R Lat (ms)	L-R Lat (ms)	L Amp (µV)	R Amp (µV)	L-R Amp (%)	Site1	Site2	L Vel (m/s)	R Vel (m/s)	L-R Vel (m/s)
Sural Anti Sensory (Lat Mall)											
Calf 14cm							Calf 14cm	Lat Mall			
Site 2											No response

Conclusion

- Given the complexity of many inpatient rehabilitation patients, it is important to continue with adequate follow-up and a broad differential, especially for patients with prolonged and complicated hospital stays.
- A high clinical suspicion for AVN must be considered given a patient with MSK related pain, multiple thrombotic events, and history of profuse hemorrhage.
- Prompt diagnosis and treatment of AVN will bring the patient great relief as well as optimize their health and function.

References

1. Karim AR, Cherian JJ, Jauregui JJ, Pierce T, Mont MA. Osteonecrosis of the knee: review. *Ann Transl Med.* 2015;3(1):6. doi:10.3978/j.issn.2305-5839.2014.11.13
2. Goodman SB, Hwang KL. Treatment of Secondary Osteonecrosis of the Knee With Local Debridement and Osteoprogenitor Cell Grafting. *J Arthroplasty.* 2015 Nov;30(11):1892-6. doi: 10.1016/j.arth.2015.05.013. Epub 2015 May 19. PMID: 26067706.