

A rare case of intraneural venous malformation of the median nerve causing carpal tunnel syndrome

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Section: Musculoskeletal system

Area of Interest: Neuroradiology peripheral nerve

Musculoskeletal system

Procedure: Biopsy

Procedure: Education

Procedure: Imaging sequences

Procedure: Surgery

Imaging Technique: PACS

Imaging Technique: MR

Special Focus: Arteriovenous malformations

Calcifications / Calculi Case Type: Clinical Cases

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Patient: 26 years, male

Clinical History:

A 26-year-old male resident doctor presented with decreased sensation and pain in his thumb, index and middle finger of right hand since one month. His symptoms aggravated during sports involving continuous hand movements, such as badminton. On examination, there was hypoesthesia in the median nerve distribution.

Imaging Findings:

Initially, X-ray is advised for the right wrist, and it showed no obvious abnormality (Fig. 1).

Also a magnetic resonance imaging (MRI) study of right hand with wrist was completed, and it revealed an intraneural lesion measuring approximately 10 x 5 mm with intralesional bleed in the median nerve in the carpal tunnel region. The lesion demonstrated iso to high signal intensity on T1W and hyperintensity on T2W and STIR sequences (Fig. 2, 3, and 4). On gradient echo image blooming was seen within the lesion suggestive of intralesional bleed (Fig. 5). On post-contrast examination, lesion showed significant heterogeneous enhancement (Fig. 6).

On histopathology the lesion was composed of intercommunicating ecstatic venous channels separated by thin fibrous stroma (Fig. 8). The lesion also showed medium to large cavernous spaces lined by a single layer of flattened endothelial cells with RBC's in lumen [2] (Fig. 9). Verhoeff-van Gieson stain for elastic fibres was negative (Fig. 10). Hence it was confirmed to be intraneural venous malformation of the median nerve [1].

Discussion:

Venous malformations of the median nerve are uncommon with only two cases being reported until now [1, 3]. These cases presented with features of Carpal Tunnel Syndrome [1].

Venous malformations comprise of masses of veins and venules lined by a single endothelial layer [2, 4] and they tend to form thrombosis often lead to forming phleboliths that are pathognomonic of venous malformations [5].

Ultrasound with color Doppler is the preferred diagnostic modality. MRI study is used to see the extent of lesion [5, 6]. However, plain MRI is not very sensitive in identifying small and deep venous malformations. Angiography can be useful in such cases [7].

The location and extent of the lesion determines the basis of treatment [1, 5]. Cryotherapy, sclerotherapy and laser therapy are used in treating the venous malformations but not effective in treating intraneural venous malformations [1]. Surgical corrections remain the treatment of choice [1].

In our case patient underwent surgery and on surgical exploration it revealed a bluish lesion with haemorrhagic foci involving the median nerve (Fig. 7). The lesion was removed completely by using microsurgical resection method, without damaging the nerve fibers [1]. No symptoms of median nerve compression were observed in the postoperative period.

Differential Diagnosis List: Intraneural venous malformation of the median nerve [1], Intraneural haemangioma, Schwannoma, Fibrolipoma of median nerve, Peripheral nerve sheath tumour

Final Diagnosis: Intraneural venous malformation of the median nerve [1].

References:

- Gonzalez Porto SA, Gonzalez Rodríguez A, Midon Míguez J (2016) Intraneural venous malformations of the median nerve. Arch Plast Surg 43(4):371-3 (PMID: [27462571](#))
- Johnson WC (1976) Pathology of cutaneous vascular tumors. Int J Dermatol 15(4):239-70 (PMID: [178614](#))
- Hariri A, Cohen G, Masmejean EH (2011) Venous malformation involving median nerve causing acute carpal tunnel syndrome. J Hand Surg Eur 36:431-2 (PMID: [21490029](#))
- Colletti G, Valassina D, Bertossi D, et al (2014) Contemporary management of vascular malformations. J Oral Maxillofac Surg 72:510-28 (PMID: [24139296](#))
- Cox JA, Bartlett E, Lee EI (2014) Vascular malformations: a review. Semin Plast Surg 28:58-63 (PMID: [25045330](#))
- McCafferty I J, Jones R G (2011) Imaging and management of vascular malformations. Clin Radiol 66(12):1208–1218 (PMID: [21944775](#))
- Dubois J, Garel L (1999) Imaging and therapeutic approach of hemangiomas and vascular malformations in the pediatric age group. Pediatr Radiol 29(12):879–893 (PMID: [10602864](#))

Figure 1

a



Description: Plain radiograph of right wrist AP view shows no obvious abnormality. No soft tissue calcification/phlebolith. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE-560011

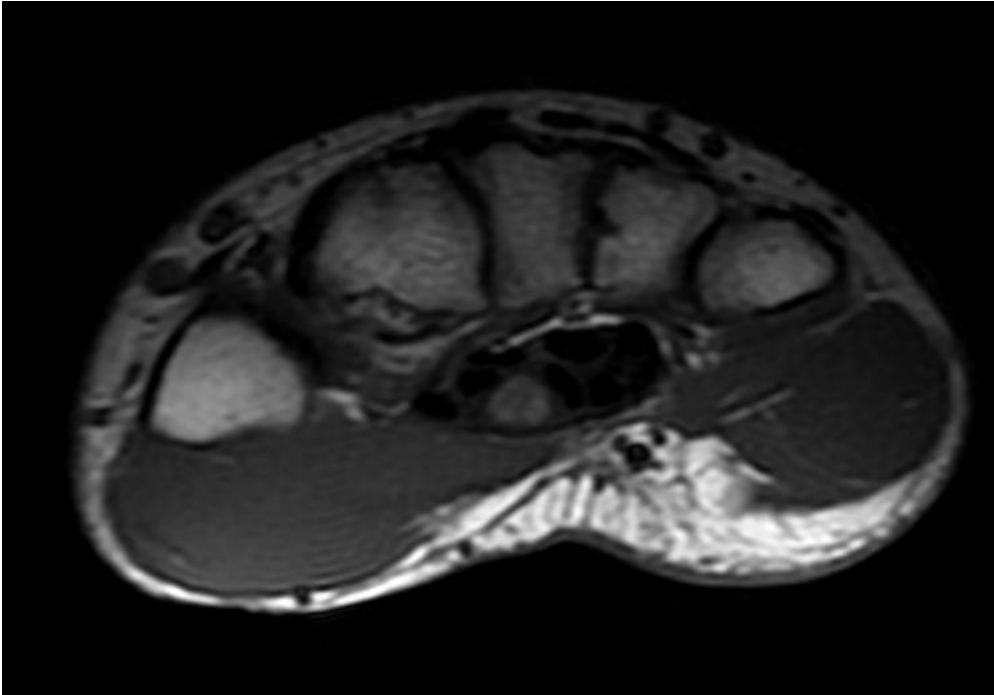
b



Description: Plain radiograph of right wrist lateral view shows no obvious abnormality. No soft tissue calcification/phlebolith. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE-560011

Figure 2

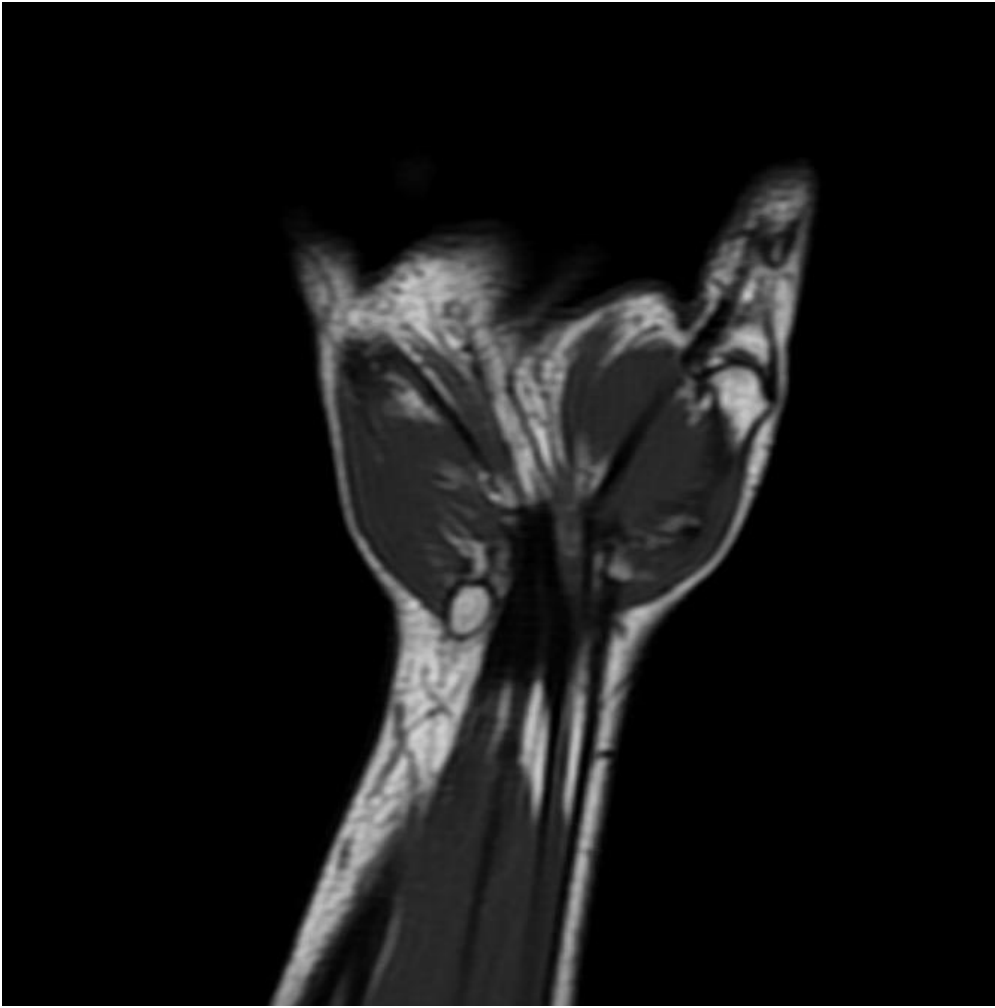
a



Description: Axial T1W image shows iso to high signal intensity lesion in median nerve at carpal tunnel.

Origin: SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL,
BANGALORE

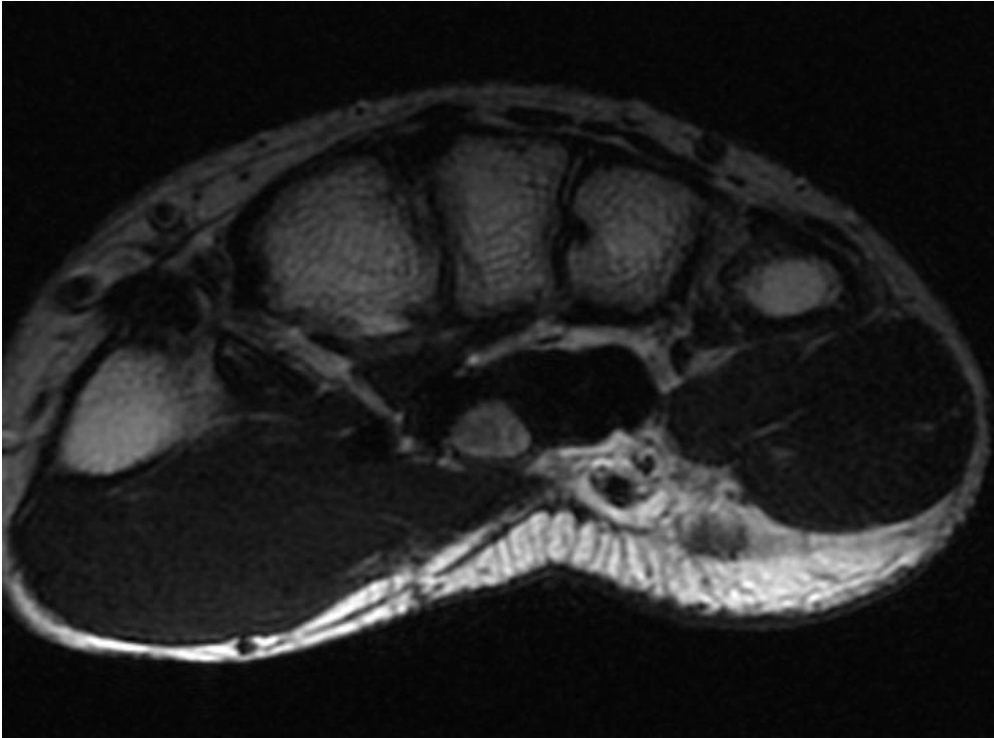
b



Description: Coronal T1W image shows iso to high signal intensity lesion in median nerve at carpal tunnel region. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

Figure 3

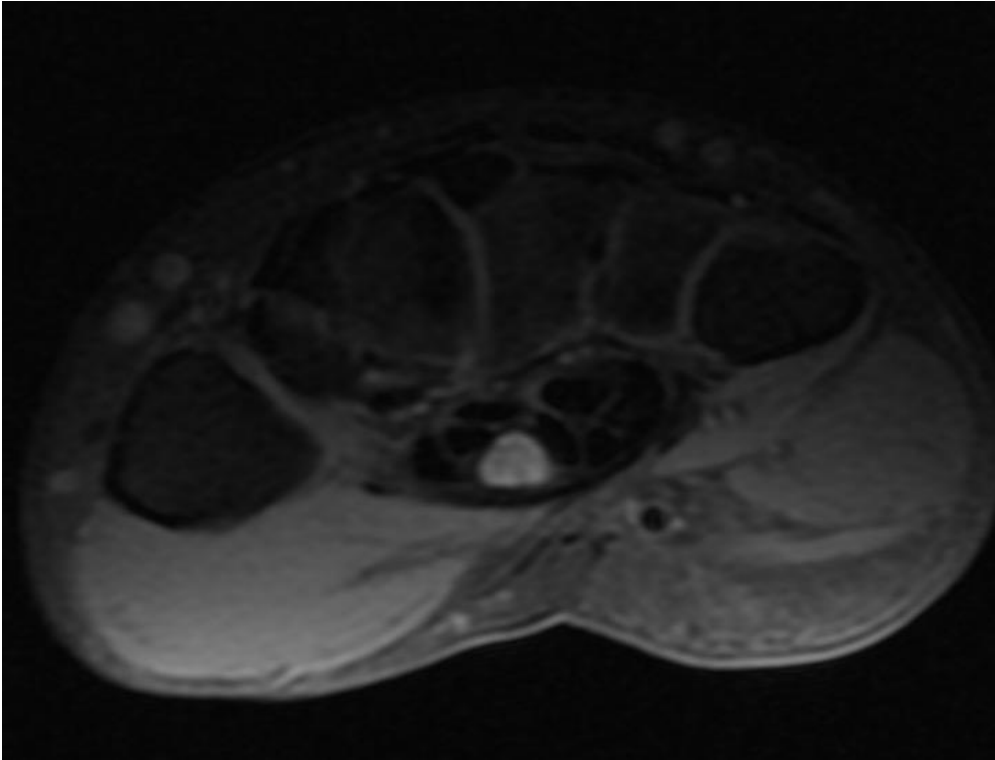
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Description: Axial T2W image shows high signal intensity lesion in median nerve in carpal tunnel region. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

Figure 4

a

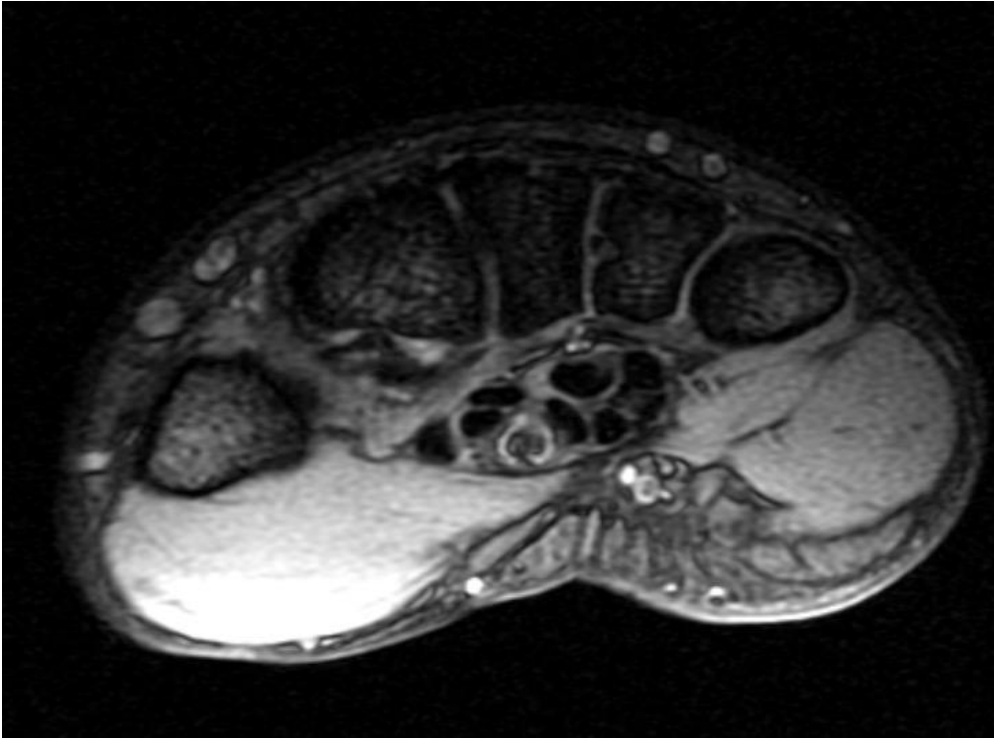


Description: Axial STIR image shows high signal intensity lesion within median nerve at carpal tunnel.

Origin: SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL,
BANGALORE

Figure 5

a



Description: Axial gradient echo (GRE) image shows blooming within lesion suggestive of intraleisional haemorrhage. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

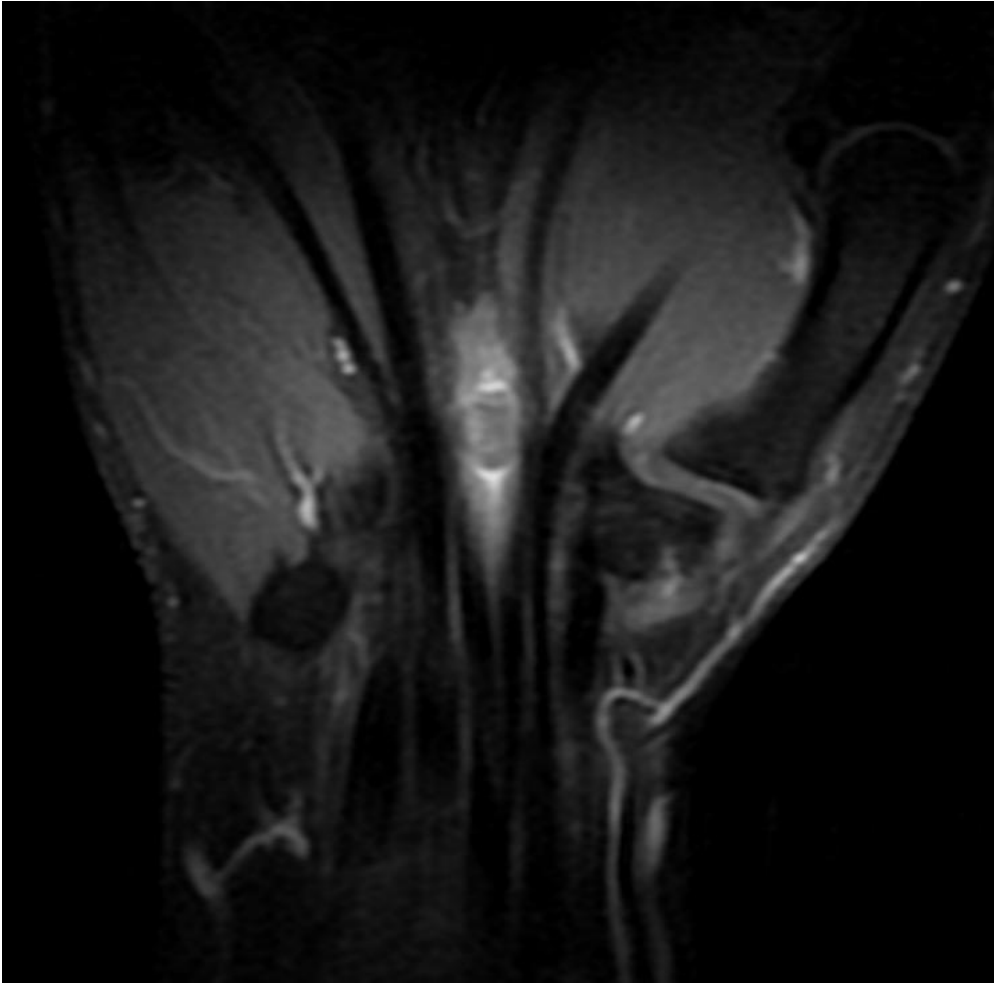
b



Description: Coronal gradient echo (GRE) image shows blooming within lesion suggestive of intralesional haemorrhage. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

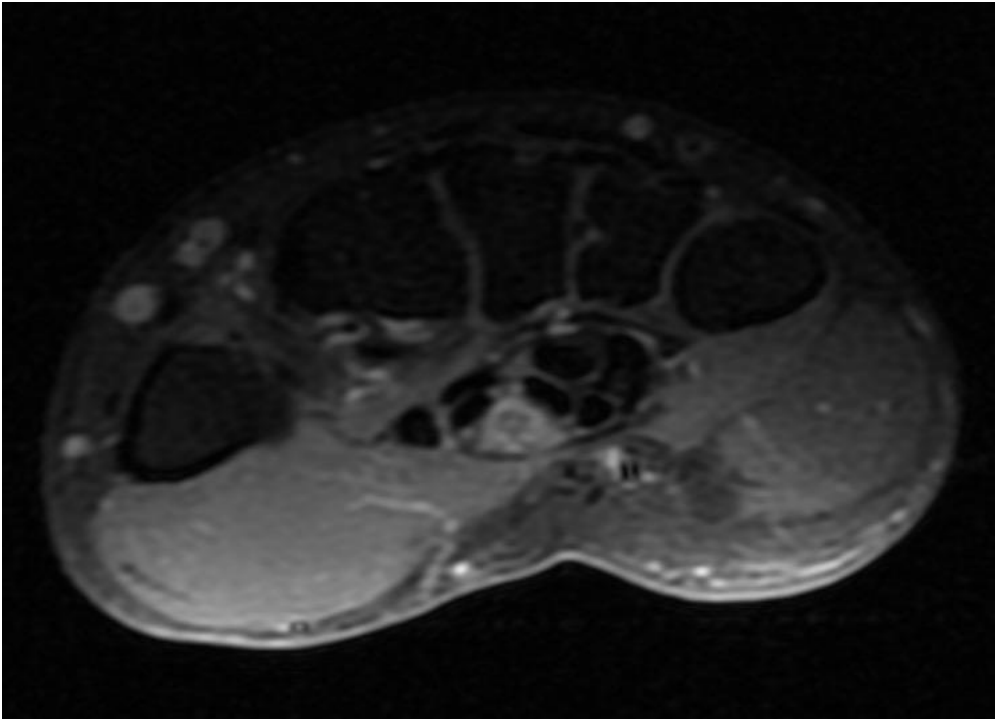
Figure 6

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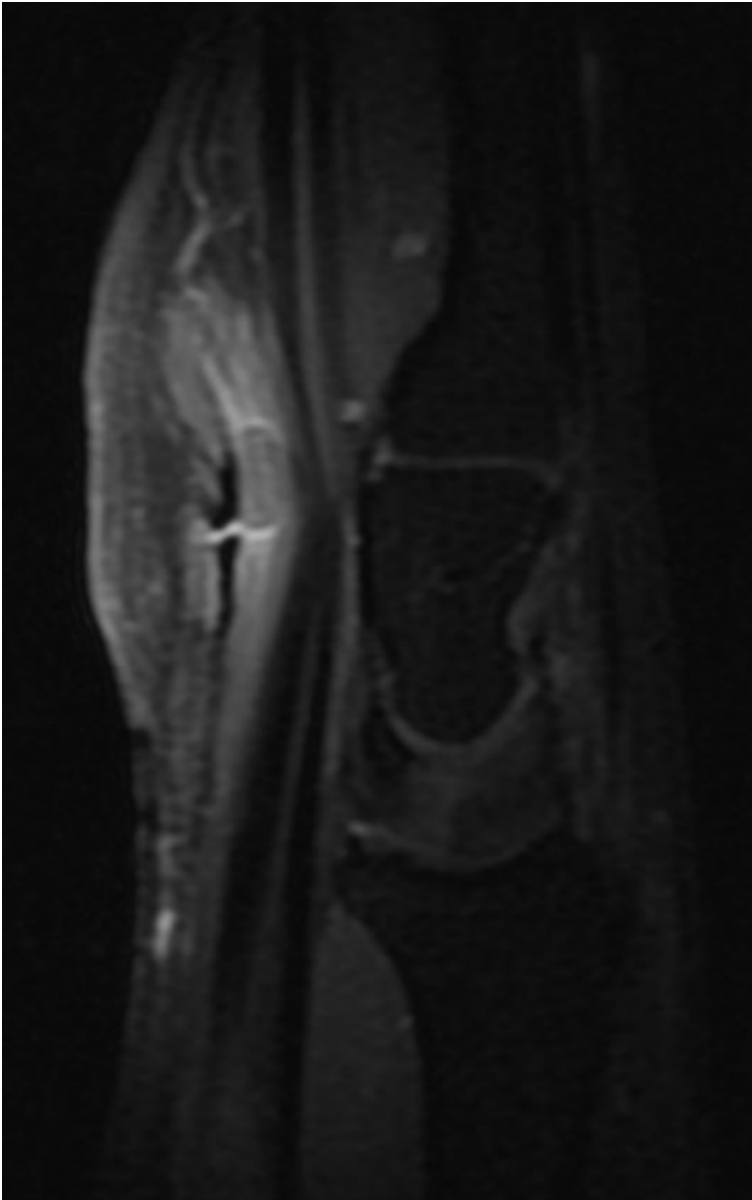
Description: Coronal contrast-enhanced Fat Sat image of wrist demonstrated significant heterogenous enhancement of the intraneural lesion of median nerve at carpal tunnel region. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

b



Description: Axial contrast-enhanced Fat Sat image of wrist demonstrated significant heterogenous enhancement of the intraneural lesion of median nerve at carpal tunnel region. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

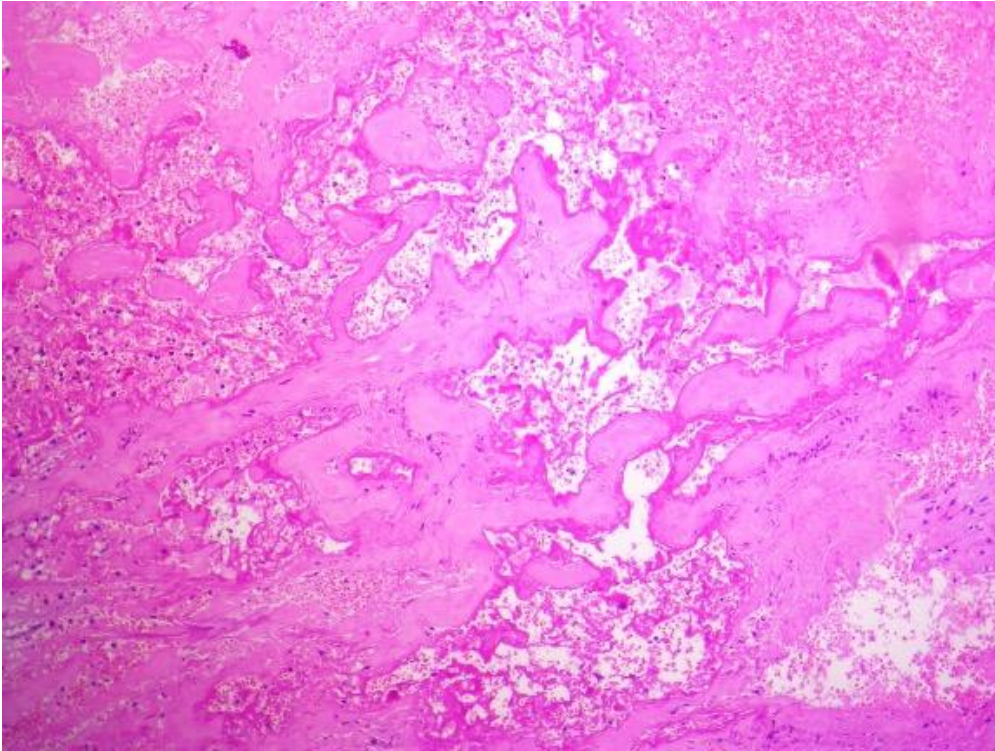
c



Description: Sagittal contrast-enhanced Fat Sat image of wrist demonstrated significant heterogenous enhancement of the intraneural lesion of median nerve at carpal tunnel region. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

Figure 7

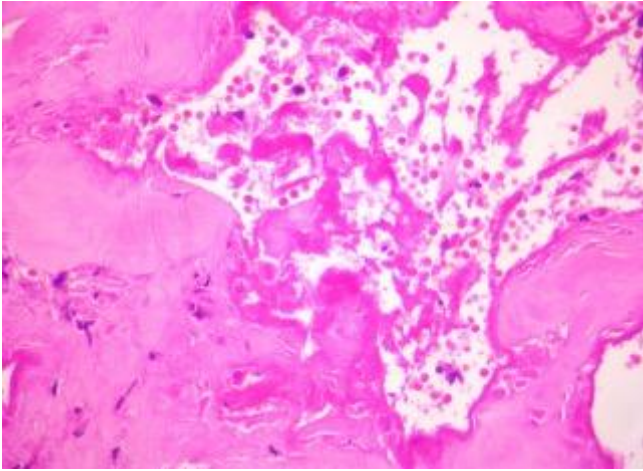
a



Description: Histopathology (H&E, 10X), image of the intraneural lesion of median nerve revealed dilated ectatic and intercommunicating vascular channels. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

Figure 8

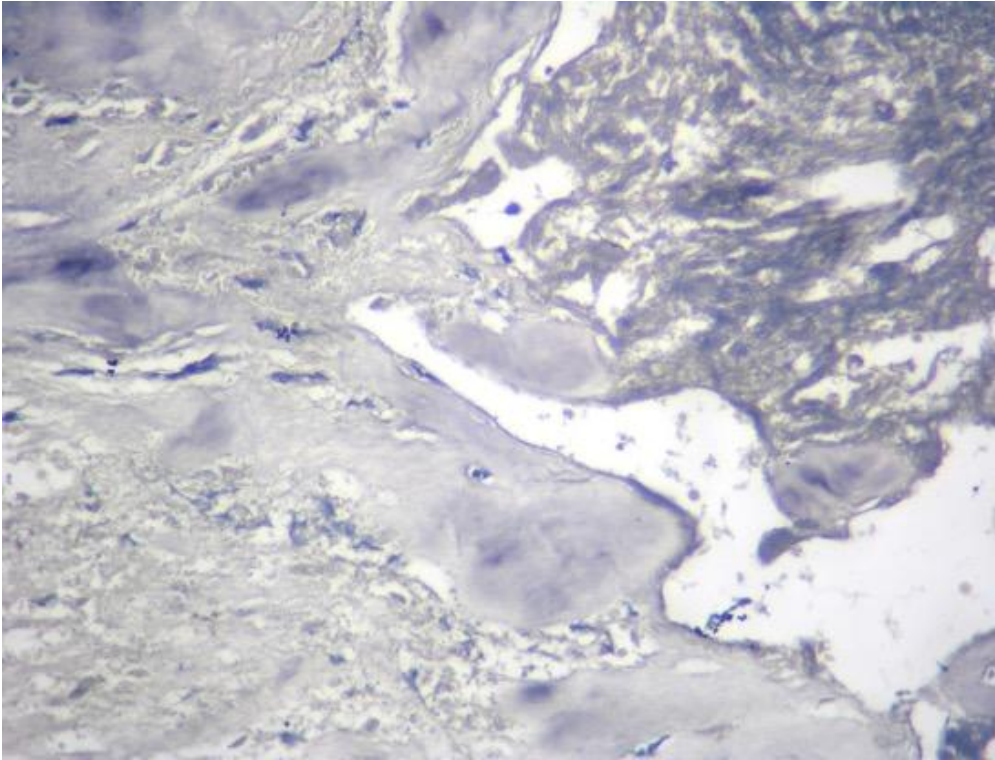
a



Description: H&E 40X image of intraneural lesion shows cavernous spaces lined by single layer of endothelial cells. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

Figure 9

a



Description: Histopathology (40X) image of the lesion is negative for Verhoeff-van Gieson stain for elastic fibres. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

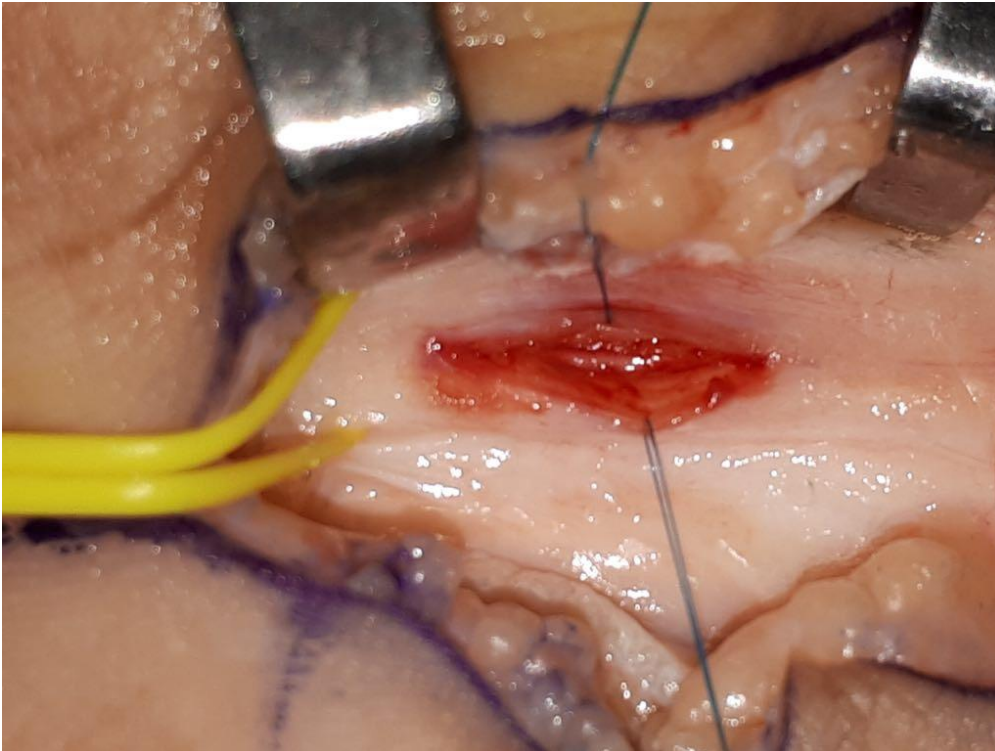
Figure 10

a



Description: Intraoperative image showed bluish lesion within median nerve. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE

b



Description: Intraoperative surgical exploration image showed lesion with areas of haemorrhage within median nerve. **Origin:** SAMSON KADE, DEPARTMENT OF RADIOLOGY, APOLLO SPECIALITY HOSPITAL, BANGALORE