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Case Report

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Schwannoma of Common Peroneal Nerve in the Knee- A Case Report

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Abstract

Schwannomas are rare benign neurogenic tumors of peripheral nerves arising from neural sheath

A 42-year-old male patient presented with the complaint of gradually increasing swelling in the posterolateral aspect of right knee for last 15-20 years. Initially it was painless but for last 10 years, it is painful especially after touching or pressing it and also on flexion and extension movements of the knee. For last 10-15 days, the pain is unbearable.

His MRI revealed it to be Schwannoma of common Peroneal nerve. He was operated under spinal anesthesia .Enucleation of the tumor was done. Continuity of common peroneal nerve was ensured. After surgical intervention, the patient's complaints completely disappeared in the post-operative period. Schwannoma of common peroneal nerve is a very rare ***tumor of knee*** *and must be kept in differential diagnosis of tumor in the posterolateral aspect of knee joint and in cases of pain in knee.*

Keywords: Schwannoma, Common Peroneal Nerve, Knee Joint, Neurilemmoma, Nerve Sheath Tumor, Neurinoma

Introduction

Schwannomas (Neurilemmomas, neurinoma) are well-demarcated, encapsulated, slow growing tumors arising from the proliferation of active peripheral schwann cells. They were first described by Verocay in 1908 and the term "Schwannoma" was introduced in 1923 by Masson [1,2]. They are frequently seen in 4th and 5th decade of life and are more common in females having less than 1% chances of malignant transformation [3]. They are painless initially but later on develop pain due to mechanical compression of nerve because of swelling. Schwannomas could be solitary or multiple [4]. They typically affect the Brachial plexus and the sciatic nerve. The Common Peroneal nerve or nerves in the foot or ankle region are rarely affected and hence Schwannomas of common Peroneal nerve are rarely reported in the literature [2,5-8].

Case Report

Patient was admitted with complaints of a gradually increasing swelling on posterolateral aspect of right knee for last 15 t0 20 years. This was painless initially but for about last 10 years he started feeling pain in it especially on touching or pressing it and on movements of knee joint like flexion and extension.

On examination, it was an ovoid swelling of about 5x3 cm size on the posterolateral aspect of right knee. It was firm in consistence, tender and horizontally mobile with pain. Not fixed to overlying skin. No disturbance of common Peroneal nerve was established. All routine laboratory tests were within normal limits.

X-Ray knee joint showed a soft tissue shadow on posterior aspect of knee joint. His MRI was suggestive of Schwannoma of Common Peroneal nerve. Enucleation of tumor was done under spinal anaesthesia. Macroscopic nerve integrity was maintained during the procedure.

The postoperative period was uneventful. Postoperatively he suffered no neurological complication except that he had weak dorsiflexion of ankle joint which was also alright after 1 month. The histopathological examination confirmed the diagnosis of benign nerve schwannoma.

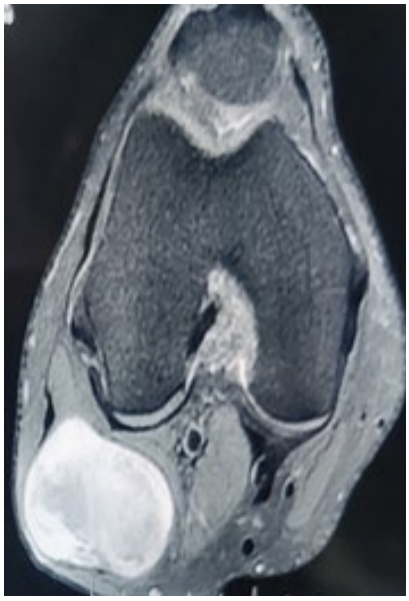

Figure 1: MRI Rt Knee Axial Plane

MRI Rt Knee

Well defined large, focal mass lesion seen in posterolateral aspect of right knee in subcutaneous region with mild lobulated margins, measuring approximately 3.3x4.7x5.7 cm (APxTRxCC). The lesion is hypointense on T1W, hyperintense on T2W and PD images with heterogenous enhancement on post contrast scan. The lesion has smooth margins and is abutting and displacing lateral gastrocnemious muscle and biceps femoris. The visualized common peroneal nerve is seen on superomedial aspect of the lesion.

These features are suggestive of heterogeneously enhancing soft tissue mass lesion in posterolateral aspect of right knee as described above – likely neural in origin – Schwannoma of common peroneal nerve.

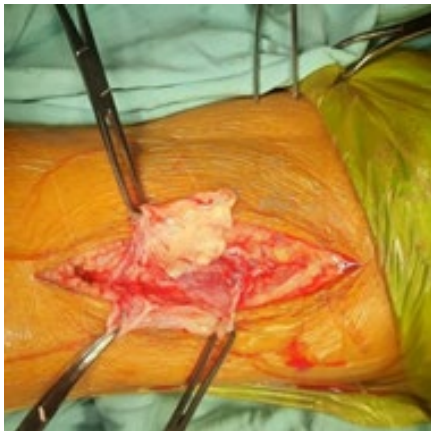

Figure 2

Operative Photograph: showing the tumor being seprated from the common peroneal nerve

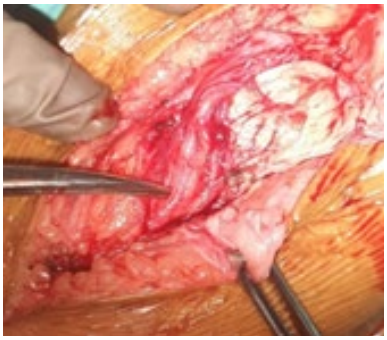

Figure 3

Operative photograph: showing common peroneal nerve after excision of the tumor and the remaining perineual sheath

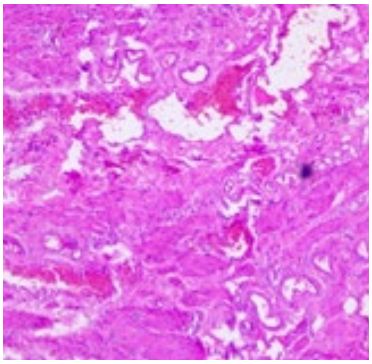

Figure 4

Histopathology

Microscopic Description:

Shows an encapsulated tumor composed of biphasic: compact hypercellular Antoni A areas and myxoid hypocellular Antoni B areas.

Nuclear palisading around fibrillary process (Verocay bodies) is seen in cellular areas. Large, irregularly spaced vessels are most prominent in Antoni B areas.

The cells are narrow, elongated and wavy with tapered ends interspaced with collagen fibres. Tumor cells have ill-defined cytoplasm and dense chromatin.

No mitotic figures seen. No evidence of malignant transformation.

Discussion

Schwannomas are most common peripheral nerve sheath tumors. They usually occur in sacral plexus and the sciatic nerve, contributing about 1% of all cases [1]. Schwannomas of Common Peroneal nerve are extremely rare and hence very rarely reported in the literature [5-8]. Schwannomas are initially painless, but later after enlargement becomes painful because of compression of nerve. MRI or magnetic neurography could be a solid ground for

diagnosis. In addition, ultrasonography could also be used as a diagnostic tool [9]. Additionally, electromyography and nerve conduction studies could be used to assess the neuromuscular status of the extremity [10]. Differential diagnosis includes the malignant peripheral sheath tumor, melanoma, and neurofibroma [11]. In the literature, no standard protocol can be found regarding the genetic screening of benign tumors of the central or the peripheral nervous system. In cases of schwannomas and meningiomas, however, associations have been described between age of onset, familial disease, and histological type of the tumors. In a study of 177 patients, Pathmanaban et al. have found a mutation-related predisposition to the formation of schwannomas, meningiomas, and other types of tumors [9]. Another author – van den Munckhof, found that a mutation in exon 2 of the SMARCB1 gene is also associated with the development of familial schwannomas and meningiomas [3]. Microscopically, schwannomas are presented by Schwann cells, without perineural cells and fibroblasts; well-presented fibrous capsule, hyalinized vessels, cellular (Antoni A) and loose-textured (Antoni B) areas and Verocay bodies can be observed.. Immunohistochemical staining is typically positive for S100 protein and pericellular collagen type IV and frequently positive for podoplanin (D2-40), calretinin, and SOX10 [10]. Mutations of the NF2, SMARCE1, SMARCB1, LZTR1, and SUFU genes have been associated with schwannoma formation [12].The treatment of choice is surgery.The tumor is enucleated after isolating the nerve. Rarely,nerve injury or dysfunction could occur. In cases of iatrogenic injury to the common Peroneal nerve a foot drop could develop with disturbance in the sensory distribution of the nerve's branches [1].

Conclusion

Schwannomas are benign lesions and their excision is generally curative. Malignant transformation is rare. They can occur in the sacral plexus and sciatic nerve in the pelvis, but schwannomas of common peroneal nerve are very rare. Surgery (Enucleation) is the treatment of choice. Nerve continuity must be maintained during surgery. Nerve dysfunction occurs rarely.

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