Journal of Clinical Orthopaedics and Trauma 10 (2019) 1073–1076

Contents lists available at ScienceDirect

Journal of Clinical Orthopaedics and Trauma

journal homepage: www.elsevier.com/locate/jcot

Peeled off water chestnut in the knee

Jitesh Kumar Jain [a], Abhishek Chandra [a, *], Aakanksha Agarwal [b], Sagar Bijarniya [a], Rajendra Prasad [a], Ramesh Chandra Meena [a]

[a] Department of Orthopaedics, SMS Medical College, Jaipur, Rajasthan, India
[b] Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan, India

ARTICLE INFO

Article history:
Received 2 April 2019
Received in revised form
29 August 2019
Accepted 30 August 2019
Available online 31 August 2019

Keywords:
Fibroma
Knee
Intra-articular

ABSTRACT

Fibroma of tendon sheaths (FTS) is an uncommon soft tissue tumour which arises from the synovial sheath of tendons. We report a histologically proven case with intrarticular 'fibroma of tendon sheath' originating from the joint capsule of the knee, an even rarer entity, in a middle-aged female presenting with knee pain, swelling with limited range of motion. MRI and arthroscopy studies revealed an intra-articular mass originating from the synovial membrane with lobulated contours. Open excision was performed because of the large size of the mass, making it inaccessible arthroscopically. The patient is symptom free since the surgery done 15 months back.

1. Introduction

Fibroma of tendon sheath (FTS) is a benign, slow growing, fibroblastic nodular neoplasm arising from the synovial membrane around tendon sheaths and was first described by Geschickter and Copeland in 1949.[1] It commonly originates from tendon sheath around fingers, hands and wrist. In the largest series reported by E. B. Chung et al.[2] most common site was flexor tendons of the thumb. Most commonly it is seen in the middle age group with male predominance. Occurrence of tendon sheath fibroma around large joint is rare and knee is the most common large joint involved by FTS. Grossly the lesion is seen as well circumscribed nodular and lobulated mass. Microscopically it consists of spindle cells in a collagenous stroma. Background matrix is hypocellular and slit like clefts may be seen in the matrix which is a distinguished feature of tendon sheath fibroma. In most of the lesions little cytological atypia is seen. We report a case of FTS arising from the infrapatellar synovial sheath of the knee joint capsule, lying behind the patellar tendon and displacing the Hoffa's fat pad anteriorly.

1.1. Case report

A 36 years old female presented with pain on walking and recurrent effusion in the knee. She had no history of trauma, fever, weight loss and no other significant personal or family history. The pain was dull, gradually increasing in intensity over the last six months which worsened on activity. On examination terminal extension was painfully restricted and anteromedial joint line was tender. A provisional diagnosis of medial meniscal tear was made.

Plain radiograph showed no significant abnormalities (Fig. 1). MRI study revealed a T1 hypointense, T2 and PD hyperintense $23 \times 42 \times 31$mm lobulated mass, infrapatellar in location, arising from the synovial sheath of the joint capsule. The patellar tendon, intra-articular ligaments and menisci were unremarkable (Figs. 2 and 3). The lesion showed no contrast uptake on post contrast scans. At this point, the preoperative differential diagnosis included a nodular form of pigmented villonodular synovitis (PVNS) and ganglion cyst. Patient was planned for arthroscopic surgery. During arthroscopy a lobulated well circumscribed mass was found anteromedially in the infrapatellar area. Procedure was change over to open excision and medial parapatellar incision was made in the infrapatellar location, extending from lower pole of patella, to just proximal to the tibial tuberosity. Soft tissue was dissected and the patellar tendon was retraced to gain access to the joint cavity. A glistening white, well circumscribed, lobulated soft mass was identified adhered to the joint capsule which was excised en-bloc with focal excision of the synovial membrane (Fig. 4). There were no intra-operative or post-operative complications.

Histological examination of the mass described it to be a pauci-cellular lesion with hyalinised stroma containing spindle cells which was diagnosed as tenosynovial fibroma or fibroma of tendon

* Corresponding author.
E-mail address: abhishekchandra.dr@gmail.com (A. Chandra).

https://doi.org/10.1016/j.jcot.2019.08.021
0976-5662/

Fig. 1. Plain radiograph of knee showing no significant abnormality.

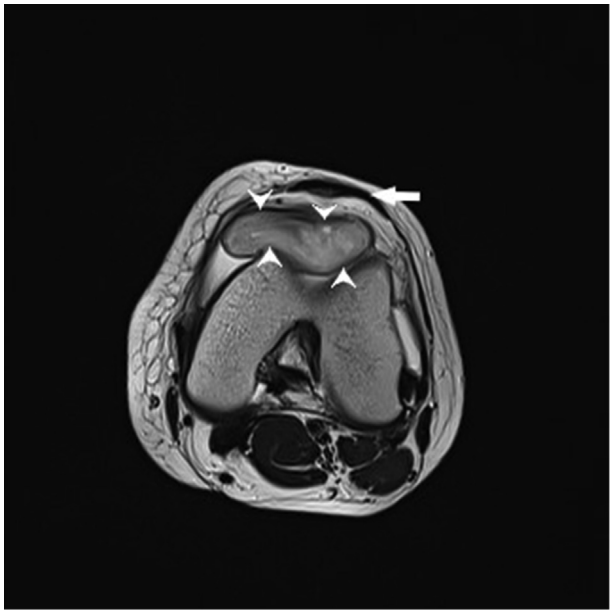

Fig. 2. T2 weighted axial MR image showing heterogenous intermediate signal intensity mass (arrowhead) lying deep to the patellar tendon (arrow) with surrounding mild joint effusion.

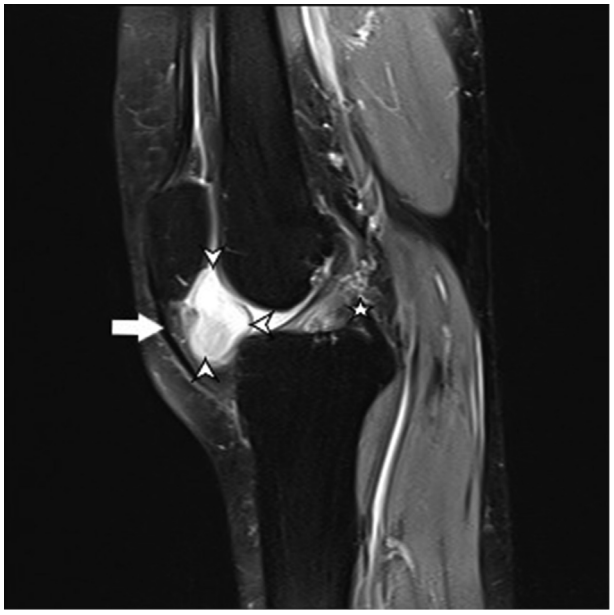

Fig. 3. Proton density fat saturated sagittal image showing the hyperintense mass (arrowhead) deep to the patellar tendon (arrow) with normal underlying cruciate ligaments (asterisk).

sheath (Fig. 5). The patient is symptom free since the surgical removal done 15 months back.

2. Discussion

FTS is a benign fibrocollagenous soft tissue tumour which is typically diagnosed in young, adult males commonly arising in tendons of the fingers, hand or the wrist with history of associated trauma in 15% cases [2,20]. The most common site around the large joints is knee joint [2]. So far only 17 case reports (18 knees, Table 1) of intrarticular fibroma of tendon sheath of knee joint have been reported in the English literature.[3–19] In the knee joint posterior

Fig. 4. Intra-operative image of the excised mass which was glistening white, well circumscribed and lobular.

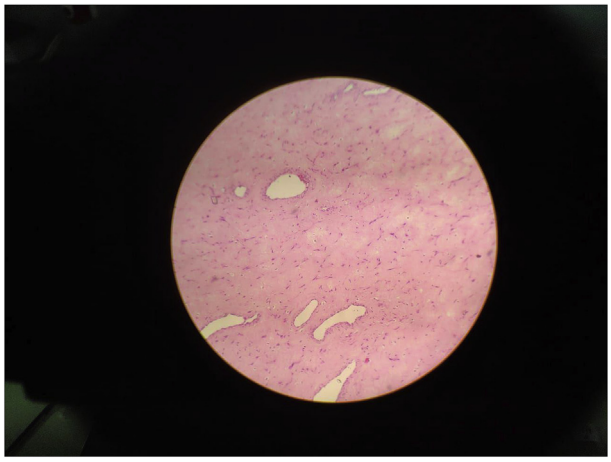

Fig. 5. High power microscopic view of the lesion showing scattered spindle cells in the background of hyalinised stroma.

compartment (PCL and posterior capsule) is the site of predilection. Our case is only the fourth one to report FTS arising from the anterior synovial sheath, lying in the infrapatellar location deep to the patellar tendon.

Pathophysiology of this lesion is not well understood but is it postulated that the similar histological structure of the joint capsule and tendon sheath may be the reason of this lesion arising from synovial membrane of the joint capsule.[21]

Plain radiographs are usually unremarkable with MRI being the radiological modality of choice for diagnosing this condition. On MRI variable appearances onT2 sequence have been described. On T1 sequences, the mass is usually hypointense to surrounding muscles with signal intensity ranging from low to intermediate to high on T2 sequences as compared to surrounding muscles. The lesion may show heterogeneity and usually does not enhance on post contrast scans. The main imaging differentials of this condition are pigmented villonodular synovitis, nodular fasciitis and giant cell tumour of tendon sheath.[9,12,20] These lesion may have similar characteristics on the MRI and there for histological examination remains the gold standard for diagnosis. MRI shows high signal on T2 and proton density sequences which was due to its pauci-cellular nature and hyalinised stroma. One imaging differential of such a presentation is a ganglion cyst, which is not an uncommon soft tissue lesion in and around the knee.

Due to the paucity of the incidence of this condition, there is no set management guideline. Open or arthroscopic excision proves to be prognostically good and potentially curable, however, 24% local recurrence has been reported in the largest series of cases reported on FTS.[2] Most of the recurrences are due to incomplete excision. There have been no reports of recurrence of the tumour in knee till date. Patient may present with symptoms which are specific to location of the lesion. Intrarticular fibromas may mimic meniscal tear any patient may have symptoms of recurrent effusion, decreased range of motion and activity related pain. Intra-articular fibroma or synovioma is a better term for these intrarticular lesions because they have no tendon origin in the knee joint.

We conclude that FTS which is a rare, benign, well demarcated, soft tissue tumour which may rarely arise from synovial membrane of joint capsule. It should be included in differentials of knee pain in middle aged patients based on the radiological characteristics.

Table 1
Published reports of Intraarticular fibromas.

Author	Site of origin	Year	Sex, treatment
Pinar et al.[4]	Posterior joint capsule	1995	38 years male, open excision
Hur et al.[5]	Infrapatellar fat pad	1999	13 years male, open excision
McGrory JE et al.[6]	Patellar tendon	2000	38 years male, open excision
Hitora et al.[7]	Posterior joint capsule	2002	50 years male, open excision was done
Takakubo et al.[8]	Between PCL and posterior capsule	2005	46 years male, arthroscopic excision
Ahn JH et al.[9]	Posterolateral capsule	2008	49 yearsmale, arthroscopic excision
Aynaci et al.[10]	Infrapatellar fat pad	2009	39 years male, open excison
Ceroni et al.[11]	Infrapatellar fat pad	2010	12 year male, open excision
Moretti VM et al.[12]	Patellar tendon (2 cases)	2010	35, male 42 years male Open excision
Griesser et al.[13]	Between PCL and posterior capsule	2011	17 years male, open excision
Kundangar et al.[14]	Between PCL and posterior capsule	2011	32 years male, open excision
Hsieh et al.[15]	From medial patella femoral ligament	2013	42 years female, arthroscopic excision
Dong-Ho Ha et al.[16]	Between lateral joint capsule and ITB	2015	45 year male, arthroscopic excision
Sameer Rathore et al.[17]	Between ITB and lateral joint capsule	2016	16 years female, open exciion
Nobuyuki Kumahashi et al.[18]	PCL ligament sheath	2017	Arthroscopic excision
Kayo Suzuki et al.[19]	Suprapatellar pouch	2017	63 years male, Open excision
Present case report	Infrapatellar synovial sheath	2019	36 years female, Open excision

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcot.2019.08.021.

References

1. Geschickter CF, Copeland MM. *Tumors of Bone*. 3 rd ed. Philadelphia: J. B. Lippincott; 1949:693–695.
2. Chung EB, Enzinger FM. Fibroma of tendon sheath. *Cancer*. 1979;44(5):1945–1954.
3. Ogata K, Ushijima M. Tenosynovial fibroma arising from the posterior cruciate ligament. *Clin Orthop Relat Res*. 1987;215:153–155.
4. Pinar H, Ozkan M, Ozaksoy D, Pabuccuoglu U, Akseki D, Karaoglan O. Intra-articular fibroma of the tendon sheath of the knee. *Arthroscopy*. 1995;11:608–611.
5. Hur J, Damron TA, Vermont AI, Mathur SC. Fibroma of tendon sheath of the infrapatellar fat pad. *Skelet Radiol*. 1999;28(7):407–410.
6. McGrory JE, Rock MG. Fibroma of tendon sheath involving the patellar tendon. *Am J Orthop (Belle Mead NJ)*. 2000;29(6):465–467.
7. Hitora T, Yamamoto T, Akisue T, et al. Fibroma of tendon sheath originating from the knee joint capsule. *Clin Imaging*. 2002;26:280–283.
8. Takakubo Y, Fukushima S, Asano T, Yamakawa M. Case Reports: intraarticular fibroma of the tendon sheath in the knee. *Clin Orthop Relat Res*. 2005;439:280–285.
9. Ahn JH, Lee YS, Lee DH, Ha HC. Intraarticular fibroma of the posterior compartment in the knee: a case report. *The Knee*. 2008;15:155–158.
10. Aynaci O, Kerimoglu S, Ozturk C, Saracoglu M, Yildiz K. Intraarticular fibroma of the tendon sheath arising from the infrapatellar fat pad in the knee joint. *Arch Orthop Trauma Surg*. 2009;129(3):291–294.
11. Ceroni D, Dumont-Anooshiravani M, Genevay M, Merlini L, Rougemonet AL. Intra-articular fibroma of the tendon sheath of the knee involving a teenager: a case report and review of the literature. *Eur Orthop Traumatol*. 2011;1:245.
12. Moretti VM, de la Cruz M, Lackman RD, Fox EJ. Fibroma of tendon sheath in the knee: a report of three cases and literature review. *The Knee*. 2010;17(4):306–309.
13. Griesser MJ, Wakely PE, Mayerson J. Intraarticular fibroma of tendon sheath. *Indian J Orthop*. 2011;45(3):276–279.
14. Kundangar R, Pandey V, Acharya KK, Rao PS, Rao L. An intraarticular fibroma of the tendon sheath in the knee joint. *Knee Surg Sport Traumatol Arthrosc*. 2011;19(11):1830–1833.
15. Hsieh PL, Wu WL, Shu GH, Tzeng WS, Yu WW, Tsai MY. Synovial fibroma in the knee: A case report. 2013;38(386):21–25.
16. Ha DH, Choi S, Kim SJ, Lih W. Intra-articular fibroma of tendon sheath in a knee joint associated with iliotibial band friction syndrome. *Korean J Radiol*. 2015;16(1):169–174.
17. Rathore S, Quadri V, Tapadia S, Krishnaiah K, Krishna VPN. Intra-articular fibroma of tendon sheath in knee joint associated with iliotibial band friction syndrome: rare occurrence in a teenage girl. *J Orthop Case Rep*. 2017;7(1):28–31.
18. Kumahashi Nobuyuki, Kuwata Suguru, Takuwa Hiroshi, Yamamoto Soichiro, Uchio Yuji. Fibromas arising from the posterior cruciate ligament tendon sheath in the bilateral knee joints: case report. *J Orthop*. 2017;14. https://doi.org/10.1016/j.jor.2017.07.016.
19. Suzuki Kayo, Yasuda Taketoshi, Suzawa Shun, Watanabe Kenta, Kanamori Masahiko, Kimura Tomoatsu. Fibroma of tendon sheath around large joints: clinical characteristics and literature review. *BMC Muscoskelet Disord*. 2017;18:376. Article number.
20. Hashimoto H, Tsuneyoshi M, Daimaru Y, Ushijima M, Enjoji M. Fibroma of tendon sheath: a tumor of myofibroblasts. A clinicopathologic study of 18 cases. *Acta Pathol Jpn Sep*. 1985;35(5):1099–1107.
21. Ralphs JR, Benjamin M. The joint capsule: structure, composition, ageing, and disease. *J Anat*. 1994;184(Pt 3):503–509.