Sinonasal Solitary Fibrous Tumor: A rare entity

Tumor Fibroso Solitário Nasossinusal: Uma entidade rara

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RESUMO

O Tumor Fibroso Solitário (TFS) é uma neoplasia de células fusiformes que é geralmente descrito na pleura. Os TFS nasossinusais são raros, com menos de 100 casos descritos na literatura. Os autores descrevem o caso de uma doente com 70 anos de idade, do sexo feminino, com um TFS etmoidal posterior a ocupar a cavidade nasal posterior. Foi referenciada a ORL por quadro de obstrução nasal com 8 meses de evolução associada a epistáxis. A rinoscopia anterior evidenciou uma neoformação friável que obliterava parcialmente a choana esquerda. A avaliação imagiológica revelou uma massa sem sinais de invasão óssea, que foi completamente removida por cirurgia endoscópica nasossinusal. O estudo histopatológico revelou um tumor de células fusiformes, sem padrão definido, com estroma rico em colagénio e ricamente vascularizado. As células tumorais apresentavam marcação intensa para CD34 e Vimentina; e ausência reatividade perante marcadores epiteliais, neurais e musculares. Não se verificou recidiva após 2 anos de seguimento.

Palavras-chave: Tumor Fibroso Solitário; Cavidade Nasal; Seios Perinasais; Cirurgia Endoscópica Nasossinusal.

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ABSTRACT

Solitary Fibrous Tumors (SFT) are spindle-cell mesenchymal neoplasms mostly described in pleura. Sinonasal SFT are rare, with less than 100 cases reported in literature. We present a case of a 70-year-old female patient with a posterior ethmoidal solitary fibrous tumor occupying the posterior nasal cavity. The patient presented with a 8-month history of unilateral nasal obstruction and epistaxis. Anterior rhinoscopy evidenced a smooth and friable mass, partially obliterating the left choana. CT and MRI revealed a well-circumscribed enhancing mass with no osseous invasion. The tumor was completely removed by endoscopic sinus surgery. Histopathological examination revealed a spindle cell tumor, with a patternless arrangement, within a collagenous stroma, highly vascularized. The tumor cells strongly stained for CD34 and Vimentin, and were negative for epithelial, vascular, neural crest and muscular markers. After 2 years of follow up, the patient remains asymptomatic with no evidence of recurrence.

Keywords: Solitary fibrous tumor; Nasal Cavity; Paranasal Sinuses; Endoscopic sinus surgery.

INTRODUCTION

Solitary fibrous tumors (SFT) are uncommon spindle-cell neoplasms, firstly described as pleural mesothelial tumors, by Klemperer and Rabin.[1-3] Involvement of numerous extrapleural sites have been reported and most authors agrees with a mesenchymal origin.[2,4] Sinonasal SFT (SSFT) are rare, with less than 100 cases reported in the literature.[3-6] Definitive diagnosis requires histopathologic analysis and immunohistochemical reactivity. These tumors are usually CD 34 and Vimentin positive and negative for epithelial, vascular, neural crest and muscular markers.[7] SSFT are treated by complete surgical excision which is associated with a favorable prognosis.[3,4,6] Most SSFT present an indolent and benign course. We present an additional case of a SSFT, managed by endoscopic sinus surgery (ESS).

CASE REPORT

A 70-year-old female presented to our department with a 8-month history of progressive left-sided nasal obstruction. Additionally, she reported recurrent episodes of epistaxis and posterior rhinorrhea. Her past medical history included arterial hypertension treated with telmisartan/hydroclorothiazide (80/12.5 mg, id). She denied smoking history and occupational exposure

to organic or inorganic dust. The patient was otherwise healthy and had no surgical past history. Anterior rhinoscopy revealed a reddish, smooth and friable mass in the posterior left nasal cavity, partially obliterating the choana (Figure 1).

Computed tomography (CT) scan revealed an isodense and homogeneous mass occupying the posterior ethmoid sinus and the left nasal cavity, with mild and homogenous contrast enhancement. The left sphenoid and maxillary sinus were opacified by secretions. No bony remodeling was evident.

Magnetic resonance imaging (MRI) identified a oval lesion, with 28x14x38mm, in the posterior ethmoid cells with inferior extension to the nasal cavity. The mass presented homogenous isointense signal on T1-weighted sequences and intense gadolinium enhancement with flow signal voids. T2-weighetd images evidenced a heterogenous isointense mass. The lesion had well circumscribed limits and there were with no signs of osseous invasion. The sphenoid sinus showed opacification by secretions.

The patient underwent ESS under general anesthesia with endotracheal intubation. Endoscopic examination showed a friable and vascularized mass, with firm consistency, in the posterior ethmoid sinus. The tumor had an intimate relation with the lateral nasal wall near the sphenopalatine foramen. We performed a left ethmoidectomy, resection of the superior turbinate and ligation of sphenopalatine artery. The lesion was removed in one piece with minimal bleeding. There were retention of secretions in the sphenoid sinus due obliteration of the sphenoethmoidal recess.

The postoperative period was uneventful and the patient was discharged 48 hours after surgery. Pathologic evaluation revealed an encapsulated mass with 3x2x1 cm. Light microscopy of the surgical specimen revealed a neoplasm constituted by oval/spindle-shaped cells, disposed on a patternless arrangement, with variable cellularity. Tumor cells were irregularly distributed in a dense collagen stroma and presented a rich vascularization. The average number of mitosis was 2 per 10 high power fields with no atypia or necrosis. Immunohistochemical staining demonstrated intense immunoreactivity for CD34 and Vimentin. Negative results were obtained after staining for S100 protein, AE1/AE3 cytokeratin, EMA, D2-40, SMA, desmine, CD31, CD99 and Bcl-2. Based on these findings, a diagnosis of solitary fibrous tumor was established. No adjuvant therapy was used. After 2 years of follow-up the patient shows no evidence of recurrence(Fig. 5).

FIGURE 1
Endoscopic examination revealing a large mass (*) with a smooth and friable surface of the left nasal cavity. NS, Nasal Septum; IT, Inferior Turbinate; LNW, Lateral Nasal Wall.

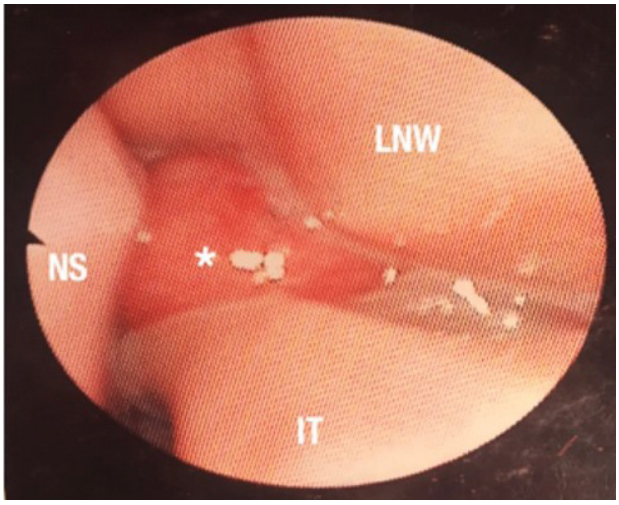


FIGURE 2
Coronal (A) and Axial (B) CT scan shows a homogenous mass projected to the left nasal cavity (*) occupying the posterior ethmoid cells and left nasal wall.

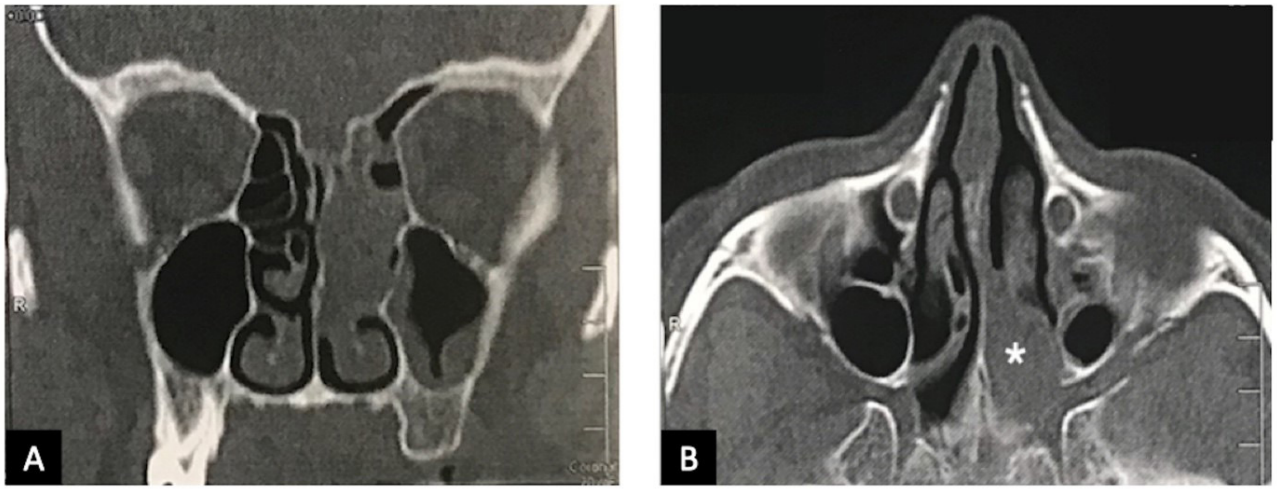


FIGURE 3
Coronal T1-weighted MRI (a) showing a isointense signal mass in the left nasal cavity. Fat suppressed and Gadolinium-enhanced coronal (b) and axial (c) T1-weighted MRI revealing intense tumor enhancement with multiple flow voids. Axial T2-weighted MRI (d) showing a well-defined heterogeneous isointense signal mass with no extension to the sphenoid sinus.

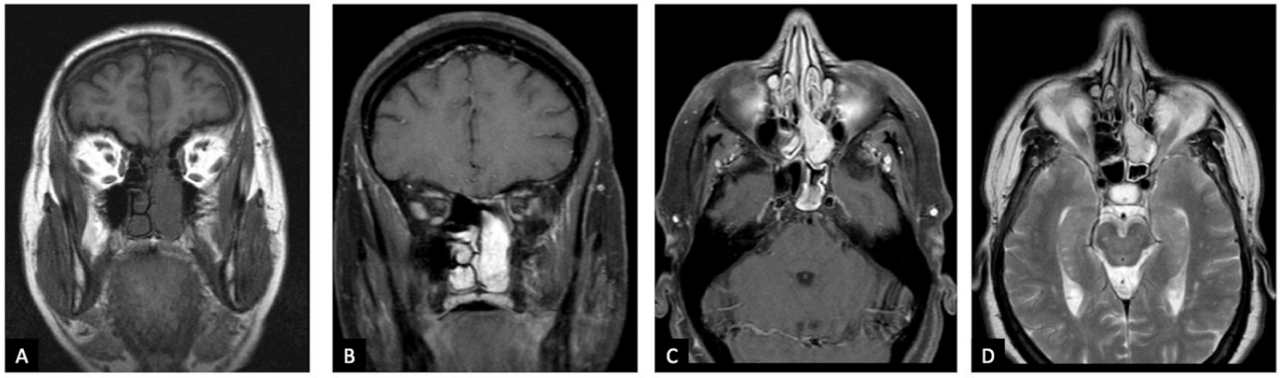


FIGURE 4
(A) Intraoperative resection of the tumor (*). (B) Endoscopic examination of nasal cavity, two years after surgery. LNW, Lateral Nasal Wall; MS, Maxillary Sinus; IT, Inferior Turbinate

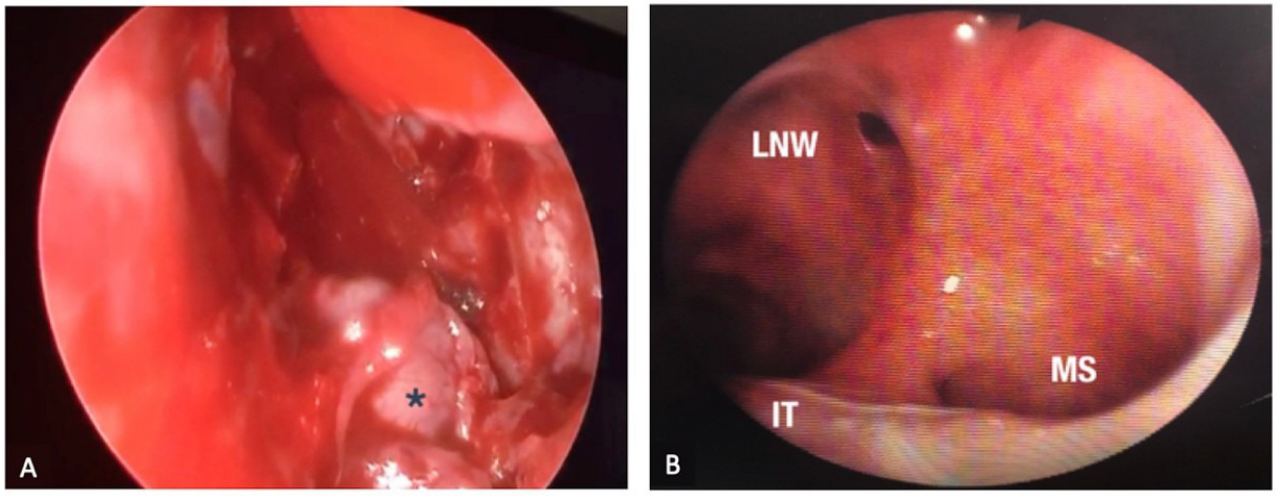
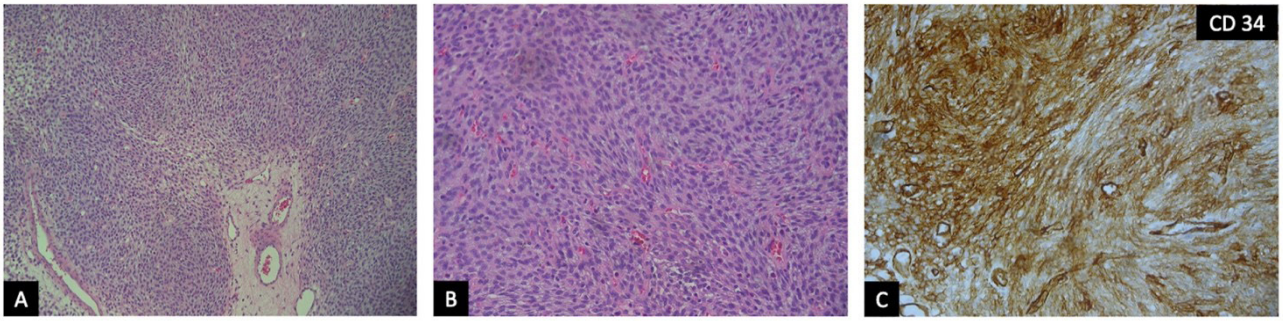


FIGURE 5
(A) Spindle cells arranged in a patternless fashion within a collagenous stroma, along with numerous vessels and dilated vascular spaces. Intratumoral variation in cellularity with hyper and hypocellular areas (H&E, x100); (B) Tumor cells with vesicular cromatin without histological evidence of malignancy (H&E, x400); (C) Tumor section showing diffuse and strongly staining for CD 34 (x400)



DISCUSSION

SFT is an uncommon neoplasm also known as benign fibrous mesothelioma, localized fibrous mesothelioma or submesothelial fibroma.[2,6] It was firstly described as a pleural mesotelial tumor.[1,12] SSFT is well described in multiple extra-pleural sites, with no relationship to serosal surfaces, and most authors agrees with a mesenchymal origin.[7,12,13] Overall, 5 – 27% of SFT occurs in head and neck region, which accounts for 25% of extra-thoracic SFT.[3,14] Oral cavity has been reported as the most frequent subsite involved in this region.[3] On the other hand, sinonasal SFT are rare, with 86 cases

reported in a recent review of the literature.[9] These are mainly adulthood tumors, with peak incidence between the 5th and 7th decades, and with no gender predominance.[2,3,9]

SSFT present as slow-growing and painless neoplasms.[6,7,9,11] Our patient presented with unilateral nasal obstruction and epistaxis, the most common symptoms of presentation.[2] Hyposmia, rhinorrhea, headache and facial pain are other reported symptoms.[13] However, patients may present proptosis and visual impairment due to orbital extension.[9,11]

Most SSFT arise in the nasal cavity and extends to paranasal sinus.[9,11] Extra-sinusal extension is uncommon.[15] CT scan is non-specific and often shows a well-defined soft tissue density mass with homogenous isoattenuation and prominent enhancement after contrast administration.[11,16] As the mass enlarges, bony remodeling can occur with local bone absorption and areas of reactive sclerosis.[11,17] Calcifications can be found within the tumor.[11]

MRI is more useful than CT in the diagnosis of SSFT. These tumors present as oblong and well-defined masses, homogeneously isointense on T1-weighted images and heterogeneous isointense or, less frequently, hypointense on T2- weighted images.[11,16] The variability of signal intensity in MRI is dependent on the proportion of fibroblasts and collagen in the neoplasm.[16] Kim *et al* reported decreased T2-weighted tumor signal intensity with increased collagenous component.[16] The presence of a low T2 signal is uncommon in other nasal tumors and is an indicator of SSFT.[11] Moreover, SSFT shows a prominent and heterogeneous contrast enhancement after gadolinium infusion due to their high vascularity.[11,16,17] Prominent vascular structures are responsible for multiple flow voids within the tumor.[11,16] Differentiate from other nasal tumors based on clinical and imagiology findings is difficult.

Differential diagnosis included mainly benign neoplasms. Inverted papilloma appears as a lobulated soft tissue mass along the lateral nasal wall and middle meatus region, with a ''cerebriform'' appearance on T2-weighted and/or contrast- enhanced T1-weighted MR images, that was absent in our patient.[8,10,11] Hemangiopericytoma is an uncommon tumor, found in the posterior nasal wall, which frequently causes bone remodeling. Hyperintense signal on T2-weighted images, and marked enhancement on T1-weighted images are typical manifestations.[11] Hemangiomas arise mostly in the nasal septum (capillary subtype) and in the lateral nasal wall (cavernous type). T2-weighted MR images shows a high signal intensity with marked contrast enhancement.[11] Capillary hemangiomas shows a non-enhanced peripheral rim and cavernous hemangioma shows a progressive enhancement pattern.[8]

Definitive diagnosis requires histopathologic and immunohistochemical anlysis.[18] Macroscopically, SSFT are well-circumscribed masses, with smooth external surface.[19] Light microscopic findings include proliferation of spindle cells randomly distributed, in a patternless arrangement, within a collagenous background stoma.[9,16,19] These tumors present two alternating cytoarchitectural patterns: hypercellular areas with spindle cells haphazardly arranged in a dense sclerotic hypocellular collagenous stroma.[16,20] Typically these tumors have a prominent vascularization.[9,11,16] Differential diagnosis is broad and includes hemangiopericytoma, juvenile angiofibroma, schwanomma, fibrous histiocytoma and fibrosarcoma.[19]

Immunohistochemistry is essential to support the diagnosis.[16] Our analysis showed a positive staining to CD 34 and Vimentin and negative reactivity to S100. The most consistently positive immunohistochemical marker for SSFT is CD 34.[21] Vimentin and Bcl-2 are moderately expressed.[11,18,21] CD34 antigen is a transmembrane glycoprotein found on hematopoietic stem cells, which is considered a very sensitive marker of SFT, with positive immunoreactivity in almost all cases (95% to 100).[6,21] Vimentin is a mesenchymal marker and Bcl-2 has been reported positive in 50-100% of the SSFT.[21] However, none of these markers are specific to SFNT.[9] CD34 is found in other spindle cell or neural tumors such as neurofibroma and schwannoma, which are typically strongly positive for S-100 protein in contrast to SFT.[13] Vimentin is expressed by other mesenchymal and epithelial tumors.4 On the other hand, negative staining of these markers does not exclude SFT.[22] Negative staining for CD 34 has been reported in malignant and dedifferentiated SFT.[21] Although CD 34 lacks specificity, its expression combined with negative staining of other markers can be helpful excluding a variety of tumors. SSFTs are commonly negative for S-100 protein (neural marker), cytokeratin (epithelial marker), smooth muscle actin, desmine and antiendomysial antibody.[4,11,21] This pattern excludes epithelial tumors, hemangioperycitomas, fibrosarcomas and neurogenic tumors.[16]

Recently SFT have been associated to a NAB2-STAT6 fusion gene,[3,9] which results from paracentric inversion in chromosome 12q13. This fusion gene is considered the molecular hallmark of SFT,[23] but its detection tests are expensive and not available in our center.[21] A strong and diffuse nuclear expression of STAT6 protein has a sensitivity to diagnose SFT above 95% and is an alternative diagnostic test.[24-26] Exclusive nuclear expression of STAT6 allows differentiation from other mesenchymal tumors that often exhibit nuclear and cytoplasmic expression.[3,24,26]

Complete surgical resection is the mainstay of treatment.[5,9,27] Obtaining wide negative resection margins decreases local recurrence rate and progression to metastatic disease.[28] Despite an increased use of ESS in the management of SSFT, commonly it does not allow evaluation of surgical margins, because en bloc resection is difficult. However, endoscopic sinus surgery

with piecemeal excision and subsequent resection of periosteum has been described as an effective and safe procedure.[7] It is a minimally invasive approach, without external incisions associated with a lower morbidity.[29] Intraoperative hemorrhage may limit this approach in less experienced centers.[2] Some authors recommend external surgical approaches for SSFT with extra-sinusal extension.[13] Complementary treatment is usually not necessary for SNT SFT, although adjuvant radiation therapy has been used in cases with locally advanced disease,[9] incomplete resection[6] and in tumors with malignant characteristics.[30]

Most pleural SFT are benign (80-88%) and cured with surgical excision. The remaining (12 – 20%) are malignant and are associated with local invasion, distant spread and higher recurrence rates. SSFT present a benign and indolent course.[25,31,32] Despite the favorable prognosis, aggressive clinical behavior with disease progression have been identified in a minority of cases.[20,31,33] Some histologic criteria are important to predict a poorer prognosis.[24,34] Nuclear atypia, hypercellularity, increased mitotic activity (>4 mitoses/10 high-power field) and necrosis are associated with malignancy.[3,35] Dedifferentiation (SFT exhibiting features of high-grade sarcoma) is also a poor prognosis factor.[21] However histology is an imperfect predictor of biological behaviour.[9] Some authors report cases of recurrence up to 69 months after surgery and metastasis in tumors with no negative histologic factors and the opposite was also reported.[32] Various authors suggest that the most significant factor to predict recurrence is the presence of positive margins.[3,25,32] Although the majority of SSFT present a favorable prognosis, long-term follow-up is imperative due to reports of recurrence even in patients without severe histological criteria.[9]

CONCLUSION

Sinonasal solitary fibrous tumors are rare mesenchymal neoplasms that usually present an indolent and benign course. Histologically, these tumors are characterized by spindle cell proliferation in a patternless arrangement, within a collagenous background stoma with prominent vascularity. Immunohistochemistry is essential to support the diagnosis of SSFT. Immunoreactivity for CD 34 and STAT6 is almost universal. Other common markers include Vimentin and Bcl-2. Negative staining for epithelial, vascular, neural crest and muscular markers exclude other neoplasms. Complete surgical excision is usually curative and can be achieved by endoscopic sinus surgery. However, long term follow-up is imperative due to reports of recurrence even in patients without severe histological criteria.

Conflito de Interesses

Os autores declaram que não têm qualquer conflito de interesse relativo a este artigo.

Confidencialidade dos dados

Os autores declaram que seguiram os protocolos do seu trabalho na publicação dos dados de pacientes.

Proteção de pessoas e animais

Os autores declaram que os procedimentos seguidos estão de acordo com os regulamentos estabelecidos pelos diretores da Comissão para Investigação Clínica e Ética e de acordo com a Declaração de Helsínquia da Associação Médica Mundial.

Política de privacidade, consentimento informado e Autorização do Comité de Ética

Os autores declaram que têm o consentimento por escrito para o uso de fotografias dos pacientes neste artigo.

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Disponibilidade dos Dados científicos

Não existem conjuntos de dados disponíveis publicamente relacionados com este trabalho.

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