CASE REPORT

Solitary Fibrous Tumor Involving the Nasal Cavity and Paranasal Sinuses with Intracranial and Dural Compromise: A Case Report and Literature Review

Laura Sofia Thomas[1], Andres R Latorre[2], Viviana Leticia Arias[3], Bernarda Jinett Acosta[4], Andres Leonardo Fuentes Francia[5]

Abstract

Introduction: Solitary fibrous tumors (SFTs) are rare neoplasms, with a mesenchymal origin that mainly affects the pleura. The SFTs from extrapleural sites are uncommon. This tumor in the nasal cavity is initially asymptomatic, and due to its growth, the patients may present nasal obstruction and epistaxis; due to compression also visual and neurological disturbances.

Methods: In this report, we present a 40-year-old male patient with a diagnosis of SFTs of the paranasal sinus with intracranial and dural invasion.

Results: This patient has no medical history and presented with bilateral nose blocked. Contrast-enhanced computed tomorgrahic scan showed a mass involving the right nasal cavity, causing deviation of the nasal septum and compromised anterior and posterior sinus. The magnetic resonance revealed the involvement of the right muscle superior oblique, and the intracranial component moves toward superior the right frontal lobe, with adjacent dural enhancement areas. The lesion was removed completely with an endoscopic approach with no recurrences two years after.

Conclusion: The SFTs of the nasal cavity and paranasal sinus are rare, with 38 cases reported in the literature, and only one case presents intracranial and dural invasion. They present mainly in the fourth and fifth decades of life and occur equally between men and women. To our knowledge this is the second case of SFTs involving the nasal cavity and paranasal sinuses with intracranial and dural compromise worldwide, and the first in Latin America. Solitary fibrous tumors (SFTs) should be a potential differential diagnosis in tumors with clinical as well as pathological complicated characterization due to the rarity of presentation at this location.

Keywords: Fibrous tissue neoplasms, Nasal neoplasms, Paranasal sinuses, Skull neoplasms, Solitary fibrous tumor.

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Introduction

Solitary fibrous tumors (SFTs) are rare neoplasms, with a mesenchymal origin that mainly affects the pleura.[1] This tumor represents 2% of soft tissue tumors, of which 12–15% occur in the head and neck.[2] The SFTs from extrapleural sites are uncommon; in the head and neck, the most common origin is the tongue. There have also been described in the external auditory canal, lacrimal sac, salivary glands, nose, and paranasal sinuses.[3] This tumor in the nasal cavity is initially asymptomatic, and due to its growth, the patients may present nasal obstruction and epistaxis and due to compression also visual and causes neurological disturbances[1] In this report, we present a male patient with a diagnosis of SFTs of the paranasal sinus with intracranial and dural invasion.

Case Description

A 40-year-old man with no past medical history presented with complaints of bilateral nose block and right-sided nasal epistaxis for the prior six months. No history of other significant nasal symptoms. Nasal endoscopy showed firm, reddish mass in the right nasal cavity, bleeding on touch, causing deviation of the nasal septum to the left.

Contrast-enhanced computed tomographic (CT) scan showed an isodense mass with diameters of 68 × 59 × 25 mm involving the right nasal cavity, which caused deviation of the nasal septum to the left and compromised the right anterior and posterior ethmoid sinus. It causes erosion of the fovea ethmoidalis, cribriform plate, and lamina papyracea. In its intracranial component, there is a displacement of the frontal parenchyma (Fig. 1). The magnetic resonance imaging revealed the involvement of the right muscle superior oblique, and the intracranial component moves toward superior the right frontal lobe, with adjacent dural enhancement areas (Fig. 2). The lesion was removed completely with an endoscopic approach with no recurrences two years after.

Pathological Findings

Two surgical specimens were received. The first one belonged to the right nasal cavity, presented as multiple irregular fragments with soft, bright brown tissue appearance. The second specimen was a skull base tumor with a similar appearance. Histopathological examination of both specimens showed a mesenchymal tumor consisting of spindle cells with oval-to-elongated nuclei and

[1,5]Otorhinolaryngology, Universidad Nacional de Colombia, Bogota, Colombia

[2–4]Cundinamarca, Universidad Nacional de Colombia, Bogota, Colombia

Corresponding Author: Laura Sofia Thomas, Otorhinolaryngology, Universidad Nacional de Colombia, Bogota, Colombia, e-mail: laurathomasp@hotmail.com

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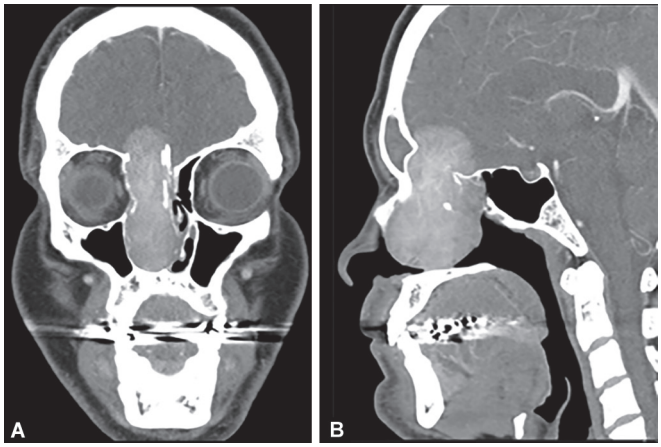
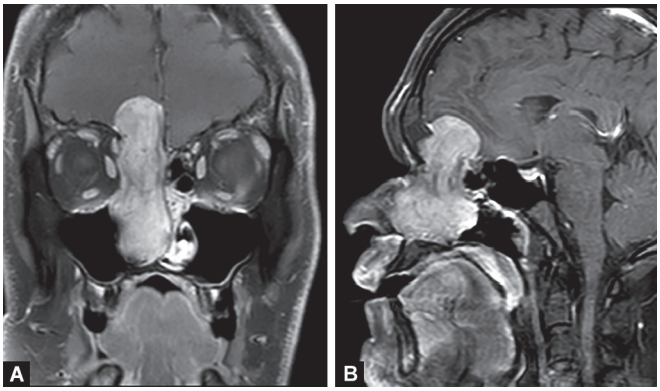
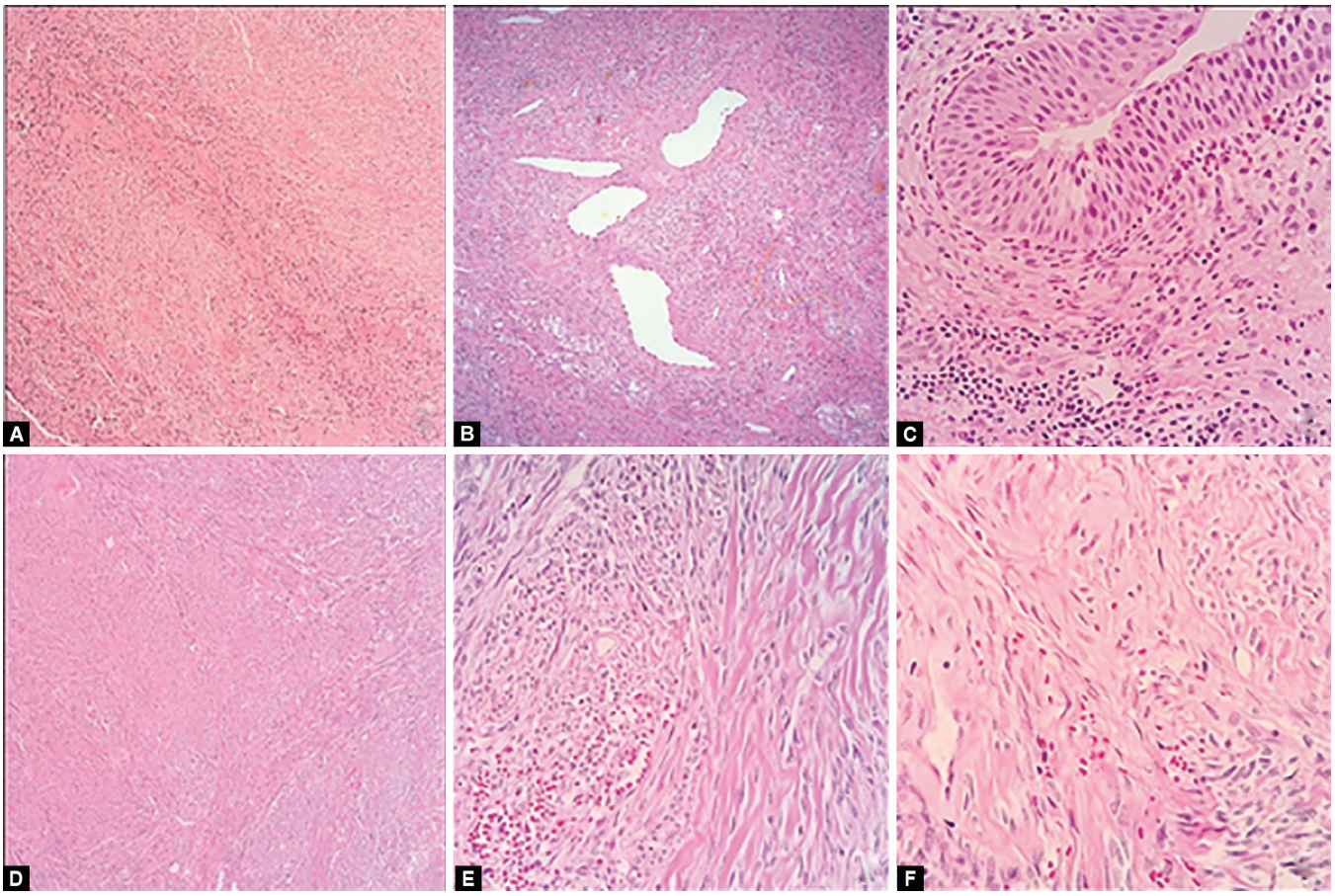


Figs 1A and B: Coronal and sagittal plane of paranasal sinuses contrast-enhanced CT scan: Isodense mass with diameters of 68 × 59 × 25 mm involving the right nasal cavity, compromised the right anterior and posterior ethmoid sinus. It causes erosion of the fovea ethmoidalis, cribriform plate, and lamina papyracea. In its intracranial component, there is a displacement of the frontal parenchyma



Figs 2A and B: Coronal and sagittal plane of paranasal sinuses magnetic resonance image revealed the involvement of the right muscle superior oblique, and the intracranial component moves toward superior the right frontal lobe, with adjacent dural enhancement areas



Figs 3A to F: Histological sections of nasal mass. (A) Low power field showing a benign spindle cell proliferation (H-E, 4x); (B) Hemangiopericytic vessel pattern (H-E, 10x); (C) Nasal epithelium. The submucous shows lymphoid infiltrates (H-E, 40x). Histological sections of skull base tumor; (D) Spindle cell proliferation arranged in short fascicles with focal extravasation (H-E, 4x); (E and F) Tumoral cells with elongated or oval nuclei without atypia over a collagen-rich matrix (H-E, 40x)

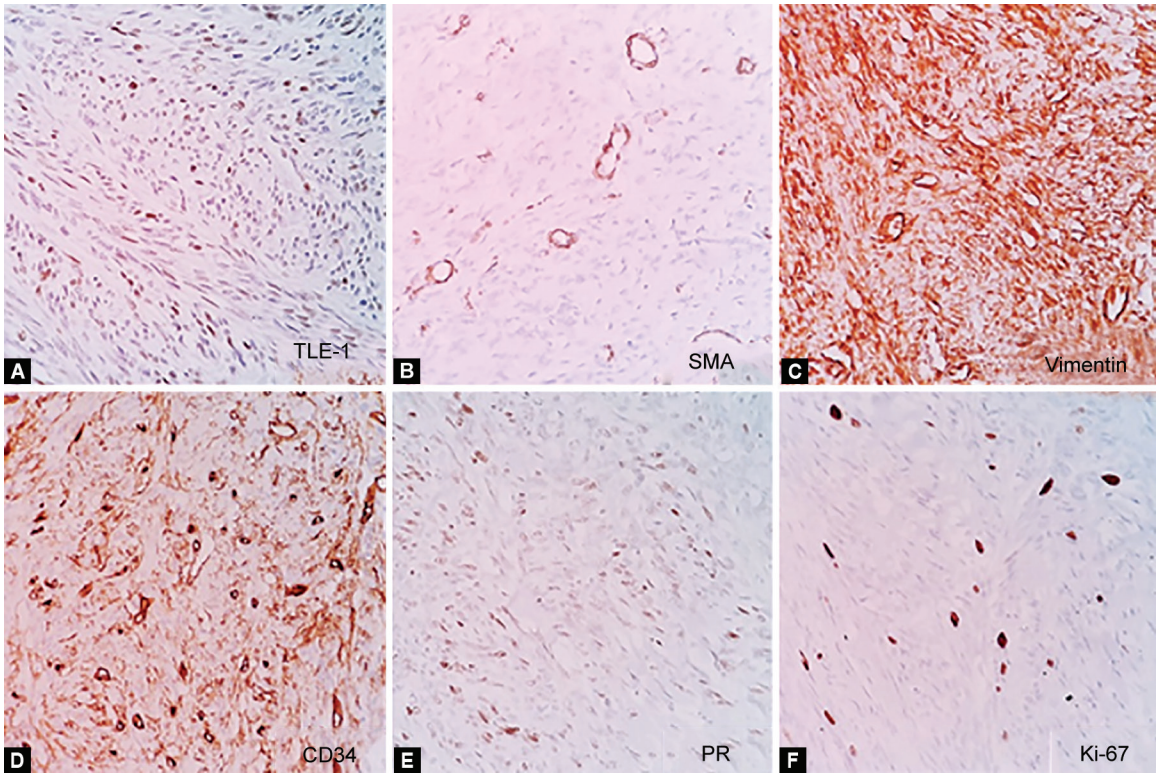
eosinophilic cytoplasm arranged in short fascicles with focal extravasation. The tumor presented hypocellular and hypercellular areas immersed in a collagenous matrix with hemangiopericytic vessel pattern areas presenting peripheral mononuclear inflammatory infiltrates. Neither necrosis nor mitotic activity was observed on 10 HPF (Fig. 3).

Immunohistochemistry examination on both samples showed that the neoplastic cells were diffusely positive for CD34 and vimentin; focally positive for progesterone receptors and TLE-1 was positive in the isolated nucleus and endothelial cells. SML, Desmin, EMA, S-100, CD56, and Sox10 were negative. The proliferation index with Ki67 was less than 2% (Fig. 4). A diagnosis of SFTs was made.

Discussion

The SFTs of the nasal cavity and paranasal sinus are rare, with 38 cases reported in the literature, and only one case presents intracranial and dural invasion. The primary site is the nasal cavity, but it has also been reported to develop in various other locations such nasopharynx, maxillary, ethmoid, frontal, and sphenoid sinus (Table 1). They are usually unilateral with a mean size of 5 cm (SD 2). They present in the fourth and fifth decades of life and occur equally between men and women.[4] Mainly benign, malignant forms are exceptional with only five cases reported, with increased cellularity, atypia, more than four mitoses in 10 HPF, and necrotic areas.

Histologically, the condition shows fibrous tissue and capillaries surrounded by spindle cells with oval nuclei; the histological differential diagnoses that should be considered are neoplasms with a spindled morphology: benign neural neoplasms, smooth muscle tumors and monophasic synovial sarcoma primarily, ICH is always necessary for an accurate diagnosis, studies revealed as valuable positive markers CD34, CD99, Bcl-2, and STAT-6.[5] Currently, the gold standard for treatment is a complete surgical resection of the tumor to avoid local recurrences.[3]



Figs 4A to F: Immunohistochemistry staining. Vimentin and CD34: diffusely positive, progesterone receptor: focally positive, TLE-1: positive in isolated nucleus and endothelial cells, smooth muscle actin (SMA) depicting vascular smooth muscle, Ki67 expression was very low (<2%), (20x)

Table 1: Clinical and demographic features of sinonasal solitary fibrous tumor

Case no.	*Age (years)*	*Sex*	*Primary site*	*Laterality*	*Local spread*	*Dural invasion*	*Malignancy*	*Surgical procedure*	*Diameter (cm)*
1. Witkin 1991	64	F	Nasal cavity	Left	No	No	No	(–)	(–)
2. Witkin 1991	36	F	Sphenoid sinus	Right	Nasal cavity	No	No	(–)	7
3. Witkin 1991	47	F	Nasopharynx	Left	Nasal cavity	No	No	(–)	4
4. Witkin 1991	55	M	Nasal cavity	Right	No	No	No	(–)	(–)
5. Witkin 1991	30	M	Nasopharynx	Left	No	No	No	(–)	(–)
6. Witkin 1991	62	M	Nasal cavity	Bilateral	Nasopharynx	No	No	(–)	(–)
7. Namon 1992	36	F	Nasal cavity	Left	Ethmoid, Frontal sinus, lamina papyracea	Yes	No	Transcranial	(–)
8. Chauhan 2003	48	F	Nasal cavity	Bilateral	Nasal cavity, right maxillary sinus	No	No	(–)	3.7

(Contd...)

Table 1: *(Contd...)*

Case no.	Age (years)	Sex	Primary site	Laterality	Local spread	Dural invasion	Malignancy	Surgical procedure	Diameter (cm)
9. Ganly 2006	57	M	Ethmoid	Left	Cribriform plate, frontal sinus	No	No	Transcranial	6
10. Ganly 2006	78	F	Frontoethmoid	Left	Dehiscence anterior craneal fossa	No	Yes	Transcranial and transfacial	6
11. Ganly 2006	51	F	Nasal cavity	Right	No	No	Yes	Transnasal	6
12. Morales–Cadena 2006	32	M	Nasal cavity	Right	No	No	No	Transnasal–Reintervention: Lynch and sublabial	6
13. Zeitler 2006	70	M	Nasal cavity	Left	Orbit extraconal space, maxillary sinus, cribriform plate	No	Yes	Anterior craniofacial resection	6.5
14. Razzaq 2007	20	F	Nasal cavity	Right	Nasopharynx	No	No	Transnasal	(–)
15. Kodama 2009	74	M	Maxillary sinus	Left	Nasal cavity	No	No	Transnasal	4
16. Takasaki 2009	74	F	Sphenoid sinus	Right	Nasal cavity, Nasopharynx	No	No	Transnasal	(–)
17. Janjua 2011	33	F	Nasal cavity	(–)	Etmoid sinus	No	No	Transnasal	(–)
18. Janjua 2011	36	M	Nasal cavity	Right	Erosion skull base and, lamina papyracea	No	No	Transnasal	(–)
19. Janjua 2011	41	M	Nasal cavity	(–)	Erosion skull base	No	No	Transnasal	(–)
20,21,22. Yang 2013**	36–55	F/M 4:1	Four in the nasal cavity, one maxillary sinus	(–)	1. Infratemporal and pterygopalatine fosae. 2,3. Maxillary sinus 4. Sphenoid	No	No	Transnasal	Mean: 5.5
23. Neme 2013	36	F	Nasal cavity	Right	Nasopharynx, paranasal sinus	No	No	Degloving	(–)
24. Anurag 2015	72	F	Nasal cavity	Right	Cribriform plate, nasopharynx, paranasal sinus	No	Yes	Lateral rhinotomy	10
25. Mathew 2015	28	M	Nasal cavity	Left	Nasopharynx, maxillary sinus	No	No	Lateral rhinotomy, medial maxillectomy	(–)
26. Rizzo 2015	26	M	Nasal cavity	Left	Nasopharynx, paranasal sinus	No	No	Transnasal	6.7
27. Varguese 2016	49	F	Nasal cavity	Left	Nasopharynx	No	No	Transnasal	(–)
28. Montoya – Filardi 2016	77	M	Nasal cavity	(–)	Nasopharynx, paranasal sinus	No	No	(–)	(–)
29. Ranjan 2017	67	F	Etmoid sinus	Left	Frontal recess, orbital, cribriform plate	Yes	Yes	Medial maxillectomy Reintervention: Lateral rhinotomy	(–)
30. Ranjan 2017	55	M	Etmoid sinus	Left	Nasal cavity	No	No	Transnasal	(–)
31. Kumar 2019	36	F	Cribriform plate	Right	Nasal cavity	No	No	Transnasal	3.3

32. Kumar 2019	54	M	Lateral wall of the nasal cavity	Left	Nasal cavity, Paranasal sinus	No	No	Transnasal	2.7
33. Kumar 2019	55	M	Maxillary sinus	Right	Nasal cavity	No	No	Transnasal	6.5
34. Kumar 2019	33	M	Nasopharynx	Bilateral	Skull base	No	No	Transnasal	2.2
35. Kumar 2019	52	M	Maxillary sinus	Right	Nasal cavity	No	No	Transnasal	4.3
36. Kumar 2019	74	M	Lateral wall of the nasal cavity	Right	Nasal cavity, paranasal sinus	No	No	Transnasal	2.2
37. Kumar 2019	67	M	Frontal sinus	Left	Nasal cavity, paranasal sinus	No	No	Transnasal	3.5
38. Kumar 2019	55	M	Lateral wall of the nasal cavity	Left	Nasal cavity, paranasal sinus	No	No	Transnasal	4.2

**Five patients characteristics reported together. F, female; M, male; transnasal, endoscopic surgical approach

Conclusion

To our knowledge this is the second case of SFTs involving the nasal cavity and paranasal sinuses with intracranial and dural compromise. Solitary fibrous tumors should be a potential differential diagnosis in tumors with clinical as well as pathological complicated characterization due to the rarity of presentation at this location.

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