Nasal cavity leiomyoma

Case report and literature review

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ABSTRACT

In this article we discussed the clinical case of leiomyoma of the lower nasal cavity. This pathology is exceptionally rare in such anatomical area, thus examination of current case is very important for medical practitioners. Often this diagnosis can be established intraoperative or after the results of morphological examination. The experience of our clinical case review can assist our colleagues in making a diagnosis at the patient primary examination stage.

We also reviewed existing publications on this topic to find common features and differences in patients with this pathology.

Keywords: leiomyoma, nasal cavity, vascular smooth muscle

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INTRODUCTION

Leiomyoma is a tumor that originates from smooth muscle tissue. Due to WHO histological classification (Sobin, 1981). there are three types of smooth muscle neoplasia: leiomyoma, angioleiomyoma and epithelioid leiomyoma. In the nasal cavity, smooth muscles are contained only in the walls of blood vessels, which in the mucous membrane contain a significant amount so when we considering leiomyoma in nasal cavity its most likely angioleiomyoma type (Barr, More, Path, & McCallum, 1990). Statistically, from all cases of leiomyoma, the nasal area accounts for less than 1 % of cases, according to published studies, therefore each new detected case is important to the medical community (Hanna, Akosa, & Ali, 1988).

Since leiomyoma is a neoplastic process, the triggering factors may be the same causes as in all neoplastic processes. Chronic damage is the main one. If we consider the nasal cavity, then any cause of irritation of the mucous membrane can be a factor that causes the development of smooth muscle hyperplasia (turbulent air movement, drug induced and vasomotor rhinitis, local manifestations of allergic reactions)

PATIENT REPORT

The patient is a 36-year-old woman; she was admitted to clinic from on 21.11.2020 with a diagnosis of "Congenital deformity of the outer nose. Curvature of the nasal septum. Chronic hypertrophic rhinitis". Main complaints included irregular shape of the outer nose and difficulty breathing. History: nasal breathing difficulties for the last 3 years.

On examination: Deformation of the outer nose in the form of scoliosis of the back of the nose. Rhinoscopy: The nasal mucosa is pink, not swollen, moist. The nasal septum is curved in the cartilaginous and bony parts. In the nasal passages mucous secretions. The lower nasal sinuses are deformed with the phenomena of hypertrophy of the mucous membrane.

On the 21.11.20 operation was performed in the amount of — Rhinoplasty, Septoplasty, Lower

turbinate interventions (Vasotomy, Conchotomy).

The removed hypertrophied mucous membrane of the lower nasal turbinates was given on morphological examination.

Assumed the patient's complaints and the data of objective examination, the diagnosis of leiomyoma was made only after morphological examination, because to make a differential diagnosis between hypertrophic rhinitis and leiomyoma of the lower nasal turbinates in the early stages is problematic. Regarding to make a correct diagnosis it is necessary to provide a morphological examination of the removed tissue.

HISTOLOGICAL STUDY

For histological examinations, samples of nasal turbinates were fixed overnight in 10 % buffered formalin at room temperature. Fixed tissues were embedded in paraffin. From paraffin blocks, 5 µm thick sections were made using a microtome. The sections were stained with hematoxylin and eosin. Histological specimens were examined using a Leica BX 51 microscope, a Leica MC 190 digital camera, and the Leica LAS software at magnifications of 100×–400×. Histochemical technique included Masson's trichrome stain for the detection of connective tissues and muscles. Immunohistochemical staining was performed to detect expression of Ki-67 (Diagnostic BioSystems Clone SP6), Smooth muscle actin (VITRO Clone 1A4), Desmin (VITRO Clone D33).

Results of the morphological examination indicates: Fragments of the mucous membrane of the nasal cavity with chronic inflammatory infiltration (mainly lymphocytic) and severe venular angiomatosis of the lamina propria by the type of venous hemangiomas and focal hyperplasia of the mucous glands with a polyp-like membrane transformation. Integumentary epithelium with focal atrophic changes. A separate fragment of the mucous membrane with leiomyomatosis of its own plate and polyp-like transformation.

Figure 1. The severe angiomasia of a submucosal layer with proliferation of smooth muscle cells in walls of cavernous vessels. H&E stain, magnification x 100.

Figure 2. Leiomyoma in the submucosal layer of the lower nasal sinuses. There is a trace of connection of proliferating leiomyoma cells with the walls of blood vessels. H&E stain, magnification x 100.

Figure 3. Tissue atypia in leiomyoma. Smooth muscle and connective tissue components of the tumor. Masson's trichrome stain, magnification x 100.

Figure 4. Low mitotic activity of leiomyoma tumor cells. Positive nuclear reaction in single tumor cells. IHC with Ki-67, magnification x 400.

Figure 5. Positive immunohistochemical reaction to Desmin in bundles of collagen fibers. IHC with Desmin, magnification x 200.

Figure 6. Expression of smooth muscle actin in leiomyoma tumor cells. IHC with sm-Actin, magnification x 200.

Pathohistological conclusion: Chronic hypertrophic rhinitis with severe angiomatosis of the lamina propria. Leiomyoma of the mucous membrane. ICD-O coding 8890/0.

DISCUSSION

We analyzed 44 existing publications of cases of nasal cavity leiomyoma and were able to determine the structure of this pathology. According to processed data, the age of patients ranged from 25 to 86 years, which is an average of 54 years (Dawlatly, Anim, & El-Hassan, 1988). Gender distribution showed that out of 44 patients, 14 were male and 30 female, in the ratio of almost 1 to 2, this can be explained by a study conducted by our colleagues on the presence of estrogen receptors on the cell surface of leiomyomatically altered smooth muscles (Kim, Shin, & Kwon, 2015).

Table 1. Cases of leiomyoma in nasal cavity.

Research authors	Year of discussed case	Patient gender: F-female M-male	Patient age	Neoplastic tissue location	Caused symptoms
Wolfowitz et al.	1973	F	42	inferior turbinate	epistaxis
Timiryaleev et al.	1973	F	25	inferior turbinate	epistaxis, nasal obstruction
McCaffrey et al.	1978	F	76	inferior turbinate	epistaxis, nasal obstruction
Daisley et al.	1987	F	32	middle turbinate	nasal obstruction
Hanna et al.	1988	F	64	inferior turbinate	epistaxis, nasal obstruction
Sawada et al.	1990	F	41	Vestibule	mass,
Ragbeer and Stone	1990	M	49	nasal floor	epistaxis, pain
Khan et al.	1993	F	71	inferior turbinate	nasal obstruction
Ardekian et al.	1993	F	54	nasal septum	nasal obstruction , pain
Trott et al.	1994	F	43	inferior turbinate	epistaxis, nasal obstruction
Maeseka et al.	1996	F	49	Vestibule	Facial pain
Nall et al.	1996	F	43	superior turbinate	epistaxis, nasal obstruction
Melgarejo et al.	1997	F	62	inferior turbinate	nasal obstruction
Murono et al.	1988	F	69	inferior turbinate	epistaxis

Bloom et al.	2001	F	50	nasal septum	nasal obstruction, headache
Bloom et al.	2001	F	70	nasal septum	Asymptomatic
Osaki et al.	2002	M	67	nasal septum	nasal obstruction
Marioni et al.	2002	M	70	Vestibule	epistaxis, nasal obstruction
Campelo et al.	2003	F	44	inferior turbinate	nasal obstruction ,epistaxis
Campelo et al.	2003	F	44	inferior turbinate	nasal obstruction
Wang et al.	2004	M	70	nasal septum	epistaxis
Wang et al.	2004	M	62	Vestibule	nasal obstruction
Wang et al.	2004	F	66	inferior turbinate	Asymptomatic
Bel et al.	2005	F	50	middle turbinate	nasal obstruction
Tsobanidou	2006	M	86	inferior turbinate	nasal obstruction
Tsobanidou	2006	F	63	superior turbinate	facial pain, nasal obstruction
Meher et al.	2007	F	24	middle turbinate	epistaxis
Vafiadis et al.	2008	M	68	Vestibule	nasal obstruction
Michael et al.	2009	M	34	inferior turbinate	epistaxis, nasal obstruction
Junior et al.	2010	F	62	nasal septum	epistaxis, nasal obstruction, pain
Arruda et al.	2014	F	49	inferior turbinate	nasal obstruction
Hammedi et al.	2014	F	42	nasal septum	epistaxis, nasal obstruction
Varghese et al.	2015	M	40	inferior turbinate	epistaxis
Mathieu et al.	2015	M	54	nasal floor	nasal obstruction ,epistaxis
Kim et al.	2015	F	58	superior turbinate	nasal obstruction and epiphora
Young Kim et al.	2015	F	70	inferior turbinate	nasal obstruction
Varghese et al.	2015	M	40	inferior turbinate	epistaxis
Varadarajan et al.	2016	F	69	nasal septum	nasal obstruction ,epistaxis
Mathieu et al.	2016	M	54	nasal floor	nasal obstruction ,epistaxis, pain
Thomas Mathieu et.al	2017	F	54	nasal floor	Asymptomatic
Chun-Hsien Ho et al.	2019	M	40	nasal floor	nasal obstruction ,epistaxis
Noreikaite et al.	2020	M	66	nasal septum	nasal obstruction
Noreikaite et al.	2020	F	52	nasal septum	epistaxis, nasal obstruction
present case	2020	F	36	inferior turbinate	nasal obstruction

According to the data, leiomyoma most often occurs in the tissue of the inferior turbinate (41%), which is quite logical given the large number of cavernous structures and high vascularization of this tissue (Barr et al., 1990). In second place is the area of the nasal septum (23%), because it also contains vascular plexuses, and this anatomical structure together with the lower nasal cavity is most affected by turbulent air movement through the nose (Hanna et al., 1988).

Pie chart 1. Tumor location in nasal cavity

Box chart 1. Symptoms caused by leiomyoma

In the initial stages of leiomyoma does not cause any complaints in patients. The formation grows slowly until it reaches a size that can interfere with normal breathing through the nose. Also, the symptoms that occur are correlated with the location of the tumor. If nasal obstruction is characteristic of almost all types of location (73 %), then epistaxis (50 %) are more likely to occur when the pathological process is located on the nasal septum and inferior turbinate (Dawlatly et al., 1988). This can be explained by abundant vascular plexuses in these areas as well as erosion of the mucous membrane by abnormal air movement.

Diagnosing leiomyoma at the preoperative stage is quite a difficult task, because the pathology is quite rare and there are no specific symptoms. Modern diagnostic methods such as CT and endoscopic examination of the nasal cavity can be informative only in the late stages of tumor development. If we talk about the disease in the early stages, as in our case, the diagnosis can be made only after a morphological examination of tissues removed during surgery. This indicates the importance and necessity of histological examination in the practice of modern otolaryngologist.

Therapeutic tactics of choice should be endoscopic excision of the tumor with revision of the nasal cavity (Salmasi et al., 2012). According to research, if the pathological tissue is not completely removed, there is a significant risk of disease recurrence Bloom, D. C., Finley, Broberg, & Cueva, 2001). We must also not forget about the possible malignancy of the tumor in leiomyosarcoma (Thakkar, 2021), which is a direct threat to the patient's life.

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REFERENCES

- Sobin, L. H. (1981). The international histological classification of tumours. Bulletin of the World Health Organization, 59(6), 813.
- Barr, G. D., More, I. A. R., Path, F. R. C., & McCallum, H. M. (1990). Leiomyoma of the nasal septum. The Journal of Laryngology & Otology, 104(11), 891–893.
- Hanna, G. S., Akosa, A. B., & Ali, M. H. (1988). Vascular leiomyoma of the inferior turbinate—report of a case and review of the literature. The Journal of Laryngology & Otology, 102(12), 1159–1160.
- Dawlatly, E. E., Anim, J. T., & El-Hassan, A. Y. (1988). Angiomyolipoma of the nasal cavity. The Journal of Laryngology & Otology, 102(12), 1156–1158.
- Salmasi, V., Reh, D. D., Blitz, A. M., Argani, P., Ishii, M., & Gallia, G. L. (2012). Expanded endonasal endoscopic approach for resection of a skull base low-grade smooth muscle neoplasm. Child's Nervous System, 28(1), 151–158.
- Kim, J. S., Shin, J. Y., & Kwon, S. H. (2015). Sinonasal Leiomyoma With Estrogen Receptor Expression. Journal of Craniofacial Surgery, 26(6), e500–e502.
- Bloom, D. C., Finley, J. C., Broberg, T. G., & Cueva, R. A. (2001). Leiomyoma of the nasal septum. Rhinology, 39(4), 233–235.
- Thakkar, H. (2021). Leiomyosarcoma of Nose a Very Rare Tumor Case Report: Unusual Case Leiomyosarcoma Inferior Turbinate. Indian Journal of Otolaryngology and Head & Neck Surgery, 73(2), 137–139.