CASE REPORT

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Leiomyosarcoma of the upper respiratory tract: A case report and review of literature

Lejomiosarkom gornjih delova respiratornog trakta

Marija Milić Perović*, Nenad Šolajić†, Nebojša Rakić‡, Lidija Vučković Hardi‡

***University Medical Center Zvezdara, Department of Pathology, Belgrade, Serbia; †University of Novi Sad, Faculty of Medicine, Department of Pathology, Novi Sad, Serbia; ‡General Hospital Subotica, Department of Pathology, Subotica, Serbia**

Abstract

Introduction. Leiomyosarcoma is a malignant smooth muscle tumor that is most often found in the gastrointestinal tract, uterus, and retroperitoneum. It is uncommon in the upper respiratory tract. **Case report.** A 53-year-old woman sought treatment for a 3-month history of nasal obstruction and facial pain. An endoscopic examination revealed a polypoid mass involving the right nasal cavity. The patient was operated on. During surgery, a bulky tumor mass was found, which involved the posterior part of the right inferior concha projecting into the lumen of the epipharynx and upper part of the oropharynx. The lesion was completely excised with adequate margins of uninvolved tissue. Histologic slides stained with hematoxylin and eosin showed interlacing fascicles of atypical spindle-shaped cells. Mitotic figures and bizarre giant cells were frequently observed. Immunohistochemical staining revealed that the tumor was positive for smooth muscle actin and h-caldesmon and negative for S-100. Histological and immunohistochemical features were consistent with leiomyosarcoma. The follow-up was regularly performed by nasal endoscopy and computed tomography, and the disease-free period has been 53 months so far. **Conclusion.** To the best of our knowledge, this is the longest disease-free period in a patient with leiomyosarcoma of the upper respiratory tract since 1996. This tumor has obscure clinical behavior and prognosis, thus we believe it is necessary to have more published data to determine the best combination of existing therapies, as well as potential new therapies, and enable a longer survival period.

Key words:
diagnosis, differential; leiomyosarcoma; histological techniques; otorhinolaryngologic surgical procedures; pharyngeal neoplasms; respiratory system; survival.

Apstrakt

Uvod. Lejomiosarkom je maligni tumor glatko-mišićnog tkiva i uglavnom je prisutan u gastrointestinalnom sistemu, materici i retroperitoneumu. Gornji delovi respiratornog trakta nisu uobičajena lokalizacija ovog tumora. **Prikaz bolesnika.** Bolesnica stara 53 godine je potražila pomoć lekara zbog zapušenog nosa i bola lica, koji su bili prisutni u prethodna tri meseca. Endoskopskim pregledom je otkrivena polipoidna masa koja je ispunjavala desnu nosnu šupljinu. Bolesnica je operisana. Tokom operacije je nađena velika tumorska masa koja je zauzimala zadnji deo desne nosne šupljine i pružala se u lumen epifarinksa i gornji deo orofarinksa. Promena je u potpunosti odstranjena, sa odgovarajućim zaštitnim rubom okolnog zdravog tkiva. Na histološkim presecima obojenim hematoksilin-eozinom uočeni su snopovi atipičnih vretenastih ćelija, sa prisutnim čestim mitozama i ćelijama bizarnog izgleda. Imunohistohemijskom analizom je dokazana pozitivnost na aktin glatkih mišićnih ćelija i h-kaldezmon i negativnost na S-100. Histološke i imunohistohemijske karakteristike tumora su odgovarale lejomiosarkomu. Bolesnica je redovno kontrolisana endoskopskim pregledom i kompjuterizovanom tomografijom i do sada je 53 meseca bila bez simptoma. **Zaključak.** Prema našim podacima, ovo je najduži period preživljavanja kod bolesnika sa lejomiosarkomom gornjih partija respiratornog trakta (od 1996. godine). Taj tumor nema jasan klinički tok i prognozu. Potrebna su dodatna istraživanja da bi se odredila najbolja kombinacija postojećih terapija, kao i potencijalne nove terapije, u cilju dužeg preživljavanja obolelih.

Ključne reči:
dijagnoza, diferencijalna; lejomiosarkom; histološke tehnike; hirurgija, otorinolaringološka, procedure; farinks, neoplazme; respiratorni sistem; preživljavanje.

Correspondence to: Marija Milić Perović, University Medical Center Zvezdara, Department of Pathology, Dimitrija Tucovića 161, 11 000 Belgrade, Serbia. E-mail: mariemilic011@gmail.com

Introduction

Leiomyosarcoma is a malignant smooth muscle tumor that is most often found in the gastrointestinal tract, uterus, and retroperitoneum [1]. It is uncommon in the upper respiratory tract. Only 1.5–2.3% of soft tissue tumors in the nasal cavity, paranasal sinuses, and nasopharynx are diagnosed as leiomyosarcomas [1, 2]. Compared to uterine and gastrointestinal variants, tumors involving this localization are much more aggressive and have a worse outcome [3].

Case report

A 53-year-old woman sought treatment for a 3-month history of nasal obstruction and facial pain. Rhinoscopy was performed, and a reddish polypoid mass involving the right nasal cavity was discovered. The patient was referred to a computed tomography scan, which confirmed a lesion with smooth contours obliterating the nasopharynx and upper portion of the oropharynx.

Therefore, endoscopic excision of this lesion was performed. During the endoscopic procedure, after aspiration of abundant thick mucus from the left nasal cavity, further examination through inferior meatus revealed a soft grayish mass in the epipharynx. Superior and middle meatus were unreachable due to deviation of the nasal septum. After resection of the septum, access to the right meatus was enabled and a bulky polypoid tumor mass was revealed, which involved the posterior part of the right inferior concha projecting into the lumen of the nasopharynx and upper part of the oropharynx without infiltration of the adjacent structure. Figure 1 shows endoscopic picture: 1-tumor, 2-choana, 3-middle nasal concha. Other significant pathologic changes were not found.

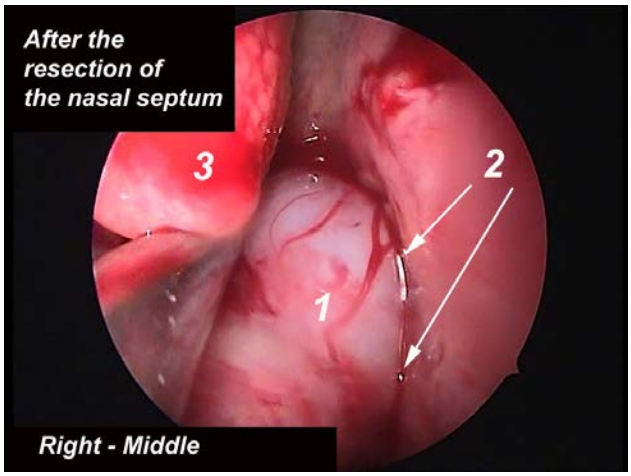

Fig. 1 – Endoscopic finding of a bulky polypoid tumor mass: 1 – tumor, 2 – choana, 3 – middle nasal concha.

The tumor was completely excised with adequate margins of uninvolved tissue and extracted through the oral cavity.

Macroscopically, the surgical specimen consisted of a polypoid pale grey tissue with a smooth surface measuring 38 × 40 × 20 mm. Figure 2 shows a tumor surgical specimen. Cross sectioning revealed a solid, structureless tissue with gelatinous areas. The tissue was entirely sampled for histological analysis.

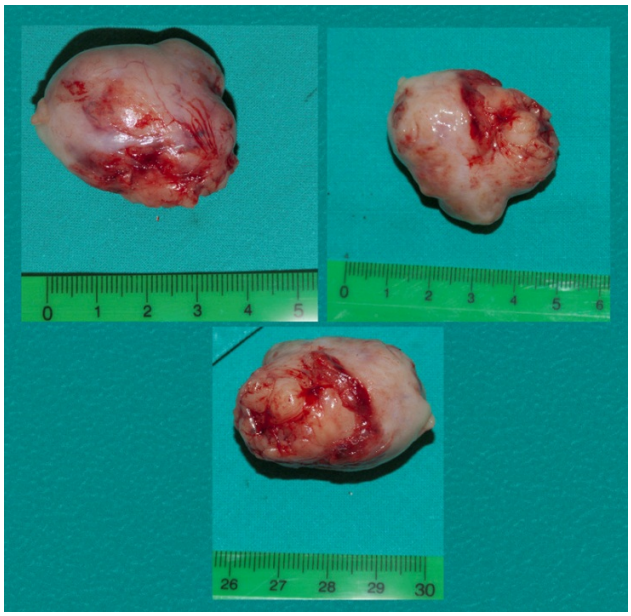

Fig. 2 – Tumor surgical specimen.

Histological slides, stained with hematoxylin and eosin (H&E), showed interlacing fascicles of atypical spindle-shaped cells with elongated blunt-ended nuclei and eosinophilic cytoplasm. Mitotic figures were frequently observed (15 mitoses per 10 high power fields), and bizarre giant cells were often present. Figure 3 shows H&E stained sections of respiratory mucosa with tumor. No necrosis was found. Immunohistochemical staining revealed that the tumor was positive for smooth muscle actin and h-caldesmon and negative for S-100. Immunohistochemistry staining of smooth muscle actin corresponding to the diffuse form of positivity is shown in Figure 4. Histological and immunohistochemical features were consistent with leiomyosarcoma. According to the French Federation of Cancer Centers Sarcoma Group [4], the histologic grade was 2. The lymphovascular invasion was not identified.

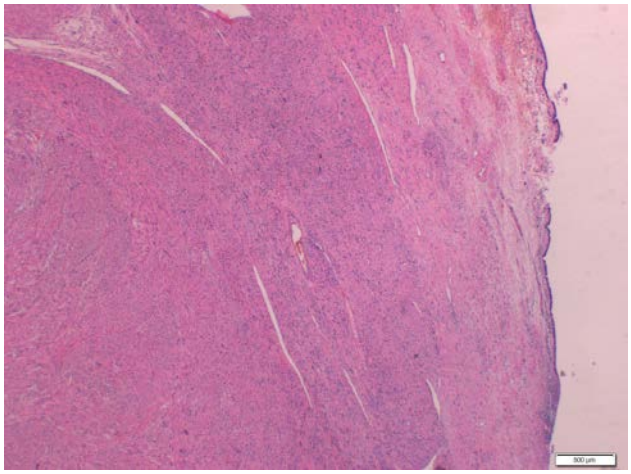

Fig. 3 – Respiratory mucosa with tumor observed (hematoxylin and eosin, ×20).

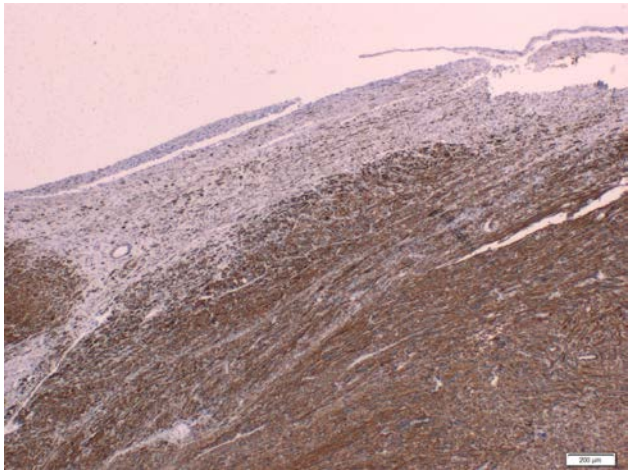

Fig. 4 – Immuhistochemical staining of smooth muscle actin shows a diffuse positivity (x40).

The patient did not receive any adjuvant therapy. The follow-up was regularly performed by nasal endoscopy and computed tomography, and the disease-free period has been 53 months so far.

Discussion

As mentioned earlier, leiomyosarcoma of the upper respiratory tract is very rare. The first case of leiomyosarcoma of the nasal cavity was documented by Dobben [5] in 1958. He reported a 69-year-old woman with leiomyosarcoma in the posterior portion of the nasal cavity. However, to verify pathohistological findings, he used only special stain Gomori. To the best of our knowledge, there are approximately 50 published case reports so far [6], but a significant number of these cases have not been confirmed by immunohistochemistry.

There are several theories about the origin of leiomyosarcoma in the upper respiratory tract. Mindell et al. [7] believe that leiomyosarcoma probably develops from the smooth muscles in the *tunica media* of the vessel walls. Mindell's theory is supported by a higher incidence of this tumor in the posterior part of the nasal cavity, which is more richly vascularised [2, 8]. The primary site of the tumor in our patient was the posterior area of the nasal cavity, too. Other authors speculated that leiomyosarcoma might originate from the dispersed undifferentiated mesenchymal cells [9,10] or myoepithelial cells of submucosal glands [11], or that they are metastases of a primary tumor located elsewhere [12]. The latter scenario is highly unlikely in our case, considering the long disease-free period of more than four years.

The exact risk factors for developing leiomyosarcoma are not known. Some authors proposed possible risk factors like prior exposure to radiation with a latency period from 6 to 35 years [13]. Moreover, there is evidence concerning the development of leiomyosarcoma in paranasal sinuses six years after irradiation and chemotherapy with cyclophosphamide due to prior Wegener's granulomatosis in a 66-year-old man [14]. Immunodeficiency is one of the predisposing risk factors: immunocompromised conditions like human immunodeficiency virus (HIV) or Epstein-Barr virus (EBV) infection are associated with the development of this tumor in any site, especially unusual locations like the central nervous system and endocrine glands [15]. Furthermore, leiomyosarcoma can develop in patients with a history of hereditary bilateral and nonhereditary unilateral retinoblastoma [16, 17]. In support of this theory, Stratton et al. [18] found a connection between Rb1 mutation and leiomyosarcoma development.

Our patient did not have any of the listed risk factors.

Prognosis is variable, and it depends on location, tumor size, the status of surgical margins, and histologic grade [2, 14]. Kuruvilla et al. [2] reported that prognosis is poorer for cases extending to ethmoid sinus rather than those localized in the nasal cavity. Also, tumor diameter greater than 5 cm is considered a poor prognostic factor [19]. However, small lesions of the paranasal sinuses could behave more aggressively and have a higher risk of local recurrence than larger tumors in the nasal cavity because of their closer anatomic proximity to vital structures [2]. The treatment of choice is radical resection with tumor-free surgical margins. In many cases, complete resection with negative margins is very hard to achieve, and in these cases, the mortality rate is much higher [3]. In our case, the tumor-free surgical margin was successfully obtained. Histologic grade is an important prognostic factor and strongly correlates with prognosis [20]. It is recommended that histologic grade is determined by the French Federation of Cancer Centers Sarcoma Group, which is the most used soft tissue grading system. It has three grades, and it is based on three parameters: differentiation, mitotic activity, and necrosis [4].

Pathohistological evaluation is necessary for a definitive diagnosis of leiomyosarcoma. Histologically, leiomyosarcoma is a spindle cell tumor with moderate to marked nuclear atypia, frequent necrosis, and brisk mitotic activity. Immunohistochemistry is essential to differentiate leiomyosarcoma from other neoplasms with spindle cell morphology such as sarcomatoid carcinoma, spindle cell melanoma, malignant peripheral nerve sheath tumor and rhabdomyosarcoma. Positive smooth muscle markers and negative S100, and cytokeratin AE1/AE3 are crucial for diagnosis [3, 21].

Leiomyosarcoma has a high rate of local recurrence of 50–75% within the first year [22, 23]. According to the survey, the 5-year survival rate for leiomyosarcoma of the nasal and paranasal sinuses is 20% [8, 10, 23]. It tends to spread hematogenously, mainly to the lungs, liver, and bones [8]. Regional lymph nodes involvement is rare, but there are few reports of sinonasal leiomyosarcoma with cervical lymph node metastasis [24, 25]. The treatment of choice is surgery. Chemotherapy with surgical treatment is recommended for inoperable cases and patients with distant metastasis. Ulrich et al. [26] reported significant tumor shrinkage after etoposide and a high dose of ifosfamide. Also, Fusconi et al. [27] documented a remarkable reduction of the tumor after ifosfamide, epirubicin, dacarbazine, and adriamycin application while Kudo and Suzaki [28] reported a significant decrease in tumor size and withdrawal of clinical symptoms following cyberknife radiotherapy of an upper respiratory tract leiomyosarcoma.

Conclusion

The presented patient did not have any of the risk factor for leiomyosarcoma. The tumor had good prognostic factors like localization in the nasal cavity, total tumor size less than 5 cm, and tumor-free surgical margins. To the best of our knowledge, this is the longest disease-free period in a patient with leiomyosarcoma of the upper respiratory tract since 1996. This tumor has obscure clinical behavior and prognosis. Therefore, we believe it is necessary to have more published data to determine the best combination of existing therapies, as well as potential new therapies, which enable a longer survival period.

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