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Case Report

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Primary Frontal Sinus Carcinoma: A Case Report

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Abstract

Primary frontal sinus carcinoma is rare, with an incidence of 0.3-1% of all paranasal sinus carcinomas. We present an 84-year-old woman who, about a month ago, developed erythema and edema of the skin of the upper eyelids and glabella, accompanied by eye discharge and slight tenderness to touch. We performed an X-ray and CT examination of paranasal cavities that found no pathological changes. The patient underwent several consultations and treatments from different specialists without any effect. Due to the growth of edema and the formation of a dense lesion at the base of the nose and frontal sinus, a repeat CT examination of the paranasal cavities was performed, which established the presence of a soft tissue oval lesion frontally in the area of the glabella with dimensions of 38/36/40 mm, which infiltrates and lyses the upper part of the right nasal bone, anterior ethmoid cells, medial wall of the right orbit, and anterior wall of the frontal sinus. The patient was referred to an otorhinolaryngology clinic, where a diagnosis of low-differentiated squamous cell carcinoma was made with the help of a biopsy and immunohistochemical examination. Due to the judgment of inoperability, definitive large-fractionated percutaneous radiotherapy was performed. The presented case illustrates the need for broad differential-diagnostic thinking in cases with edema in the head region.

Keywords: Frontal; Sinus; Cancer; Erythema; Edema.

Introduction

Primary frontal sinus carcinoma is extremely rare, with an incidence of 0.3-1% of all paranasal sinus carcinomas. It occurs more often in adults over 50, mostly men [1,2]. Its symptoms are vague and nonspecific. They can very commonly mimic different allergology, dermatologic, or neurologic conditions making the diagnosis hard to conclude. A CT/MRI examination in suspicious cases is vital to the early diagnosis. Pathological examination is needed for the definite diagnosis of primary frontal sinus carcinoma. The predominant histological type in 39.8% of cases is squamous cell carcinoma [3]. Treatment includes total surgical resection followed by radio- and chemotherapy. Due to the late diagnosis and the ability of the tumor to infiltrate into surrounding tissues and cavities, these types of malignancies have a very poor prognosis.

Results

We present an 84-year-old woman who, about a month ago, developed erythema and edema of the skin of the upper eyelids and glabella, accompanied by eye discharge and slight tenderness to touch. We performed an X-ray and CT examination of paranasal cavities which found no pathological changes. After consultation with an allergologist, treatment with antihistamines was started, but due to lack of effect, the patient was referred to the clinic for diagnostic clarification. Additional paraclinical examinations and specialized consultations did not confirm the suspicions of dermatomyositis, trichinellosis, and an acute inflammatory process. Treatment with antibiotics and corticosteroids remained ineffective. Due to the growth of edema and the formation of a dense lesion at the base of the nose and frontal sinus (Figures 1A and 1B), a repeat CT examination of the paranasal cavities

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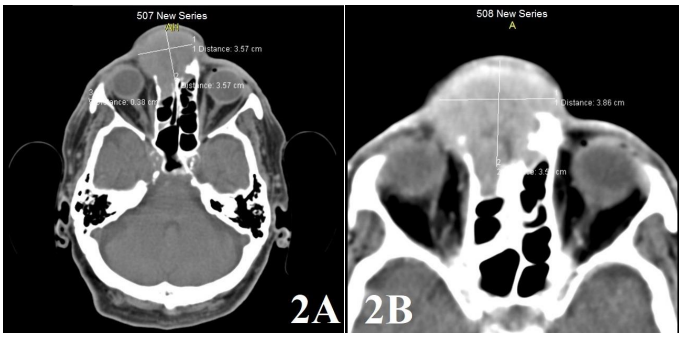
was performed, which established the presence of a soft tissue oval lesion frontally in the area of the glabella with dimensions of 38/36/40 mm, which infiltrates and lyses the upper part of the right nasal bone, anterior ethmoid cells, medial wall of the right orbit, and anterior wall of the frontal sinus (Figures 2A and 2B). The patient was referred to an otorhinolaryngology clinic, where a diagnosis of low-differentiated squamous cell carcinoma (NSE - negative, p63 - positive, cytokeratin 34be12 - positive) was made with the help of biopsy and immunohistochemical examination. Due to the judgment of inoperability, definitive large-fractionated percutaneous radiotherapy was performed according to a scheme of 10x3 Gy (equivalent to 38 Gy). Due to the inoperability and lack of good response to the performed radiotherapy the patient died two months after therapy.

Figures 1A & 1B: Clinical examination established erythema and edema of the skin of the upper eyelids and glabella, and a dense lesion at the base of the nose and frontal sinus.



Figures 2A & 2B: CT scan established the presence of a soft tissue oval lesion frontally in the area of the glabella with dimensions of 38/36/40 mm, which infiltrates and lyses the upper part of the right nasal bone, anterior ethmoid cells, medial wall of the right orbit, and anterior wall of the frontal sinus.

Discussion

Frontal sinus malignancies are rare and are most commonly the result of a direct extension of the tumor from the nasal cavity or anterior ethmoid sinuses into the frontal sinus. Primary frontal sinus carcinomas are an extremely rare finding [4]. In 1907, Prawssud was the first to report cell carcinoma of the frontal sinus [5]. Since then, there have been multiple cases presented and in all, we find that the initial making of the diagnosis can be challenging. The most frequent histologic types are represented by squamous cell carcinomas (SCC, 39.8%), mature B-cell lymphomas (17.5%), epithelial neoplasms not otherwise specified (10.5%), and Adenocarcinomas (ADC, 9.9%) [3].

The most common symptoms in primary frontal sinus carcinomas can include nasal obstruction, nasal bleeding, nasal discharge, anosmia, proptosis, diplopia, facial pain, headache, and oppressive sensation [6]. Reddy et al. [7] also reported a case of frontal sinus cancer mimicking acute frontal sinusitis. Edema of the periorbital region could also be one of the initial symptoms [8]. In the present case, the patient was initially treated for allergic sinusitis and acute inflammatory process before the diagnosis was made. The patient was also examined for dermatomyositis and trichinellosis which could also mimic some of the symptoms of frontal sinus carcinomas. The unspecific early symptoms and the rarity of the condition are the reason why these tumors are often diagnosed at an advanced stage.

An early diagnosis usually depends on the characteristics found upon CT/MRI examination. Evaluation of the precise extent of frontal sinus tumors is extremely important for the surgical approach and post-surgical treatment planning in patients. The definite diagnosis is made with biopsy and pathological results [9]. The present case showed mainly skin symptoms, including erythema and edema in the upper eyelids and glabella. It is important to keep in mind the diagnosis of frontal sinus carcinoma in patients with such symptoms, especially when they are persistent and not responding to therapy. Early CT/MRI examination in suspicious cases can help in an earlier diagnosis and better prognosis.

The treatment of frontal sinus carcinomas includes radical surgical excision, radio- and chemotherapy. Due to the rarity of the condition, there are no standard treatment strategies. Previous studies show that radical resection significantly reduces the symptoms and decreases the recurrence rate. A clinical trial reported by Guntinas-Lichius et al. [10] described the different options for therapy in patients with perinasal tumors. The study indicated that radical surgery is the treatment of choice for stage I-II tumors. However, due to the complicated anatomy of the frontal sinus, particularly in those patients with wide intracranial invasion, radical surgery can sometimes be impossible. In the present case, the reason for inoperability was the fact that the tumor infiltrates and lyses the upper part of the right nasal bone, anterior ethmoid cells, medial wall of the right orbit, and anterior wall of the frontal sinus. Therefore, large-fractionated percutaneous radiotherapy was performed. Several studies show that radiotherapy is helpful in local control of frontal sinus carcinomas which are inoperable [11]. In advanced paranasal sinus carcinomas radiotherapy alone proved to be ineffective [12]. Currently, the combination of chemotherapy and radiotherapy is considered to be the favored choice.

Frontal sinus malignancies show a very poor prognosis, with a 5-year disease-specific survival of 44.2% regardless of the histology. This is due to the late diagnosis due to non-specific symptoms and the early propensity of tumors involving this area to easily invade the orbit and the anterior cranial fossa [3]. Most of the described cases that are operable have good outcomes after surgery, but the majority of patients don't have satisfactory effects from the following chemo and radiotherapy. Wang Z et al. followed 5

cases of squamous cell carcinoma and one case of osteosarcoma all of whom underwent successful surgery. Nevertheless, the median survival time was 56 months [13]. In the presented case a lethal exitus followed two months after therapy. Inoperable patients tend to have a lower survival rate than in general.

Conclusion

The rarity of frontal sinus carcinomas, their unspecific symptoms, and the poor prognosis make it a very complicated diagnosis. In conditions with poor prognosis and low survival rate it is vital to make an early diagnosis. Our case highlights the need for broad differential-diagnostic thinking in cases with edema in the head region as it is one of the early and unspecific symptoms in frontal sinus carcinomas.

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