Posttravmatik frontoetmoidal mukopiyosel

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Abstract

Paranasal sinus mucocoeles are mucus-containing cystic structures with an epithelial lining that completely fills in the paranasal sinuses. Although they are benign in nature, they may result in the destruction of the surrounding bony structures over time. Clinical findings such as exophthalmia, visual impairment, and diplopia occur due to pressure of the fronto-ethmoidal mucocoele on the orbita. Currently, the endoscopic intranasal approach is preferred in the treatment of paranasal sinus mucocoeles due to its minimal morbidity and low recurrence rates. Here, we present a patient aged 12 years who had a right fronto-ethmoidal mucopyocoele secondary to a probable trauma 2 years prior, which resulted in proptosis due to pressure on the orbita. (Turk Pediatri Ars 2017; 52: 108-10)

Keywords: Mucopyocoele, posttraumatic, pediatric

Introduction

Paranasal sinus mucocoeles are cystic structures containing mucus that completely fill the paranasal sinus. Mucocoeles that occur as a result of infectious causes or that are infected secondarily are named mucopyocoeles (1).

In adults, mucocoeles are observed most frequently in the frontal sinus and 90% are unilateral (2). Nicollas et al. (3) reported that mucocoeles arose most frequently from the ethmoid sinus in their paranasal sinus mucocoele case series, which was composed of 10 pediatric patients. Although mucocoeles are benign, they may lead to damage in the surrounding bone structures in time (1, 4). Clinical findings including exophthalmos, visual disturbance, and diplopia occur as a result of orbital compression by frontoethmoidal mucocoeles (5). Currently, the endoscopic intranasal approach is preferred in the treatment of paranasal sinus mucocoeles because of its low morbidity and low recurrence rates (6). In this article, we present a 12-year-old patient with frontoethmoidal mucopyocoele orbital compression, which was thought to have been formed following trauma 2 years previously.

Case

A 12-year-old female patient presented to the Ophthalmology Outpatient Clinic of our hospital because of a protruding right eye. On ophthalmologic examination, no pathology was observed in vision and eye movements except for proptosis. The patient was examined by the department of otolaryngology. In the history of the patient, it was learned that the protrusion of the right eye had increased gradually over six months, symptoms including visual loss, diplopia, nausea, vomiting, and fever were absent and swelling around the eye occurred following falling flat from a height of 1.5 meters approximately two years ago. On physical examination, it was observed that the right eye was pushed in the inferolateral direction. There was no limitation in the eye movements. On endoscopic nasal examination, a mass with regular surface was observed in the right middle meatus, which pushed the middle concha towards the midline. Paranasal sinus computerized tomography (CT) revealed a hypodense mass lesion that filled both frontal sinuses and right ethmoidal cells, caused erosion in the bone structures, and drooped into the right orbital extraconal area eroding the right

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lamina papricea (Figure 1). Paranasal sinus magnetic resonance imaging (MRI) revealed a hyperintense mass lesion in T2-weighted images (AG) and hypointense in T1 AG in bilateral frontal sinuses and right ethmoidal cells drooping into the right orbit, with no contrast uptake following intravenous contrast material injection. The bone remodeling findings defined on imaging and clinical findings suggested mucocoele.

Thus, endoscopic frontoethmoidal mucocoele marsupialization was performed under general anesthesia. The part of the mucocoele drooping from the middle meatus was cut with a hook knife and the incision edges were expanded using a microdebrider. A purulent secretion was emptied after incision. The resulting cavity was washed with normal saline. Movement in the orbital middle wall was observed when the right eye was compressed because of the defect in the lamina papricea (Figure 2). The cavity in the left frontal sinus was evaluated using 70-degree endoscope because of the defect in the frontal sinus septum, the internal part of the sinus was irrigated and aspirated. At the follow-up visit one month later, it was observed that proptosis in the right eye had improved (Figure 3). No recurrence was observed at the 18-month follow-up visit. Written informed consent was obtained from the family of the patient reported in this study.

Figure 1. Coronal CT image reveals a mucocoele that fills the frontal sinus and ethmoidal cells, and droops into the right orbital extraconal area by eroding the lamina papricea (red arrow)

Discussion

Mucocoele was defined for the first time in 1896 (7). In adults, it is most commonly observed in the frontal sinus with a rate of 60-65%. This is followed by the ethmoid sinus with a rate of 20-25%, maxillary sinus at 5-10%, and sphenoid sinus at a rate of 5-10% (2). In pediatric patients, Nicollas et al. (3) reported that mucocoeles arose most frequently from the ethmoid sinus in their paranasal sinus mucocoele case series, which comprised 10 pediatric patients. In our case, it was thought that the mucocoele arose from the frontal sinus and extended towards the ethmoid sinus.

In pediatric patients, most commonly congenital diseases (ciliary dyskinesia and cystic fibrosis), chronic rhinosinusitis, radiotherapy, previous nasal surgery, trauma, and congenital benign and malignant tumors (dermoid cyst, meningocele, glioma, lymphangioma, angiofibroma,

Figure 2. Appearance of cavity with 30° angled endoscope following marsupialization of the frontoethmoidal mucocoele (yellow arrow: defect area in the lamina papricea)

Figure 3. a, b. Appearance of proptosis in the right eye before surgery (a) and in the first month after surgery (b)

“Ewing” sarcoma, rhabdomyosarcoma, neuroblastoma, adenocarcinoma) may lead to formation of mucocelles (8). Our patient had no history of systemic disease, chronic rhinosinusitis, radiotherapy or previous nasal surgery. In the etiopathogenesis, we think that this mucoccele developed with obstruction of the frontal sinus ostium following trauma and led to bone damage by expanding towards the ethmoid sinus, because there was a history of trauma two years previously.

Although paranasal sinus mucocelles are benign, they may expand into the orbits and cranium by pushing the surrounding bone structures with the pressure they generate in time or by leading to damage in the bone structures with the action of prostaglandin E2 and collagenase enzymes released from the surrounding inflammatory cells (1, 4). Paranasal sinus mucocelles cause clinical findings by compressing the surrounding adjacent structures, especially the orbits and cranial or facial structures through expansion. The most common clinical findings include proptosis, which occurs with compression of the orbits; limited eye movements, which occurs with compression of the ophthalmic muscles; and diplopia and vision loss, which occur with compression of the optic nerve (9). In our patient, proptosis was present as a result of compression of the orbit due to a lamina papricea defect; no pathology was found preoperatively by an ophthalmologist in eye movements and visual examination.

Computerized tomography gives significant information related with expansion, thinning or erosion in the bone tissue, and the expansion of mucocelles. Magnetic resonance imaging gives significant information about surrounding soft tissues in patients with orbital or intracranial expansion. In addition, contrast-enhanced MRI is the most significant imaging method, which is preferred for the differentiation of mucocelles from paranasal sinus tumors (10). On the paranasal sinus CT of our patient, a hypodense mass lesion that eroded the right lamina papricea and drooped into the right orbital extraconal area was observed. Paranasal sinus MRI revealed a mass lesion compatible with mucoccele, which was observed to be hyperintense in T2-weighted images (AG) and hypointense in the T1 AG drooping into the right orbit with no contrast uptake following intravenous contrast material injection.

Although surgical treatment used to be performed with an external approach for frontoethmoidal mucocelles, currently, the endoscopic intranasal approach is preferred because of its advantages including low morbidity, low recurrence rates, and reduced hospitalization period (6). No recurrence was observed in our patient at the 18-month follow-up visit following endoscopic intranasal marsupialization.

In the etiology of paranasal sinus mucocelles, history of maxillofacial trauma should be absolutely interrogated. Although it is a benign lesion, it may lead to bone damage and clinical findings with compression of the orbits and skull base. In the treatment of paranasal sinus mucocelles, low morbidity and low recurrence rates can now be achieved with the endoscopic intranasal approach.

Informed Consent: Written informed consent was obtained from the patient's parents who participated in this case.

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