■ CASE STUDY

Metaplastic Ossification in Nasal Polyp

Juan Andrés Márquez Moyano,[a] Antonia Navarro Cantero,[b] Francisco Javier Garrido Iniesta,[c] Carmen Poyato Zamorano,[a] and Julio Marques Asin[c]
[a]Servicio de Otorrinolaringologia, Hospital de Montilla (Empresa Pública Hospital Alto Guadalquivir), Montilla, Córdoba, Spain
[b]Servicio de Anatomía Patológica, Hospital de Montilla (Empresa Pública Hospital Alto Guadalquivir), Montilla, Córdoba, Spain
[c]Servicio de Radiodiagnóstico, Hospital de Montilla (Empresa Pública Hospital Alto Guadalquivir), Montilla, Córdoba, Spain

Metaplasia is the production by cells of a kind of tissue other than that corresponding to their lineage, ie it represents the conversion of one tissue into another. Bony metaplasia has frequently been described in polyps of the gastrointestinal tract. In nasal polyposis it is an extremely uncommon finding. We describe the case of a 42 year-old female presenting nasal obstruction due to a unilateral nasal tumour. She was operated on by means of endoscopic sinonasal surgery and the definitive diagnosis was nasal polyposis with areas of bony metaplasia.

Key words: Nasal polyposis. Metaplastic ossification. Nasal tumour. New bone formation.

Metaplasia ósea en pólipo nasal

La metaplasia es la producción por parte de las células de un tipo de tejido distinto del de su estirpe; es el cambio de un tejido en otro. La metaplasia ósea ha sido descrita en pólipos del tracto gastrointestinal con cierta frecuencia. En la poliposis nasal es un hecho extremadamente infrecuente. Describimos el caso de una paciente de 42 años con clínica de obstrucción nasal; presentaba una tumoración nasal unilateral y fue intervenida mediante abordaje endoscópico nasosinusal. El diagnóstico definitivo fue poliposis nasal con áreas de metaplasia ósea.

Palabras clave: Poliposis nasal. Metaplasia ósea. Tumor nasal. Formación de hueso nuevo.

CLINICAL REPORT

We present the case of a 42 year-old female, without any history of relevance, who was referred to our clinic through having presented, over the course of several months, bilateral nasal obstruction with predominance of the right nostril. This was accompanied by hyposmia and aqueous rinorrhea.

In the anterior rhinoscopy, it was possible to observe a polypoid formation in the right nostril and septal deviation towards the left nostril. By means of a nasal endoscopy using 30º optical elements, further details could be seen of the lesion, which presented areas of fleshy appearance and completely occupied the middle meatus, widening the semilunar hiatus and sitting between the line of the maxilla and the middle turbinate, which it covers in part; it subsequently separates the middle turbinate from the side wall and occupies all of the meatus to the region adjacent to the choana.

An imaging study was carried out using a computerized tomography of the paranasal sinuses, in which axial slices and coronal reconstructions were obtained, along with images with the bony window. The study shows a mass with the density of soft tissue and lobulated edges located on the right middle meatus, causing a widening of the said meatus and destroying some of the septa of the ethmoidal cells; there are images of bone "trapped" in the mass. The lesion extends to occupy completely the right maxillary sinus and some homolateral ethmoidal cells, causing a discreet expansion of the adjacent bone, without appreciation of lithic images, adenopathies or other findings of pathological significance; all of this indicates a benign aetiology, with calcification inside (Figure 1).

A nasosinusal endoscopic approach was applied with general anaesthesia (rigid nasal optics of 30º and 70º) for diagnostic and therapeutic purposes in order to carry out the resection of the tumour occupying the anterior ethmoid and leave a spontaneous cavity after its removal; palpation revealed rounded areas of great hardness. The intraoperative biopsy samples were later reported to be "inflammatory polyp." An enlarged middle meatotomy allowed the extraction of abundant mucopurulent contents from the right maxillary sinus, with a mucosa presenting an oedematous appearance, but without evidence of tumour, granulomas, cysts or other lesions. It was blocked off with a nasal tampon (Merocel® 8 mm) impregnated in antibiotic cream (Cicatral®). Progress has been satisfactory and the patient is asymptomatic and without endonasal lesions 1 year after surgery.

The microscopic study revealed an inflammatory polyp with the presence of metaplastic bone comprising broad trabeculae, lined with an edging of osteoblasts (Figure 2). No cartilage or enchondral ossification was identified.

Paper presented as a poster communication at the 56th National Congress of the SEORL. Madrid, November 12-15, 2005.

The authors have not indicated any conflict of interest.

Correspondence: Dr. J.A. Márquez Moyano.
Río Genil, 9, 2.º D. 14900 Lucena. Córdoba. España.
E-mail: marquezmoyano@terra.es

Received February 13, 2006.
Accepted for publication September 20, 2006.

DISCUSSION

Metaplasia is the production by cells of a type of tissue different from that of its lineage.[1] Previous publications posited the triggering effect of prior surgery.[2] In our case, the patient was being operated on for the first time, as also occurred in another of the cases reported.[1] The formation of new bone would imply the presence in the polyp of pluripotential cells or else the cells present there became differentiated into pluripotential cells.

The subsequent differentiation to bone cells would be fostered by specific growth factors. The factors implicated and described include bone morphogenetic proteins (BMP: BMP-2 and BMP-4/5) and transforming growth factor beta-1 (TGF β-1), factors that intervene in endochondral osteogenesis and fracture repair. Its ability in vivo to trigger the cascade of endochondral osteogenesis in heterotopic tissue has also been shown.[1,3] BMP and TGF β-1 have been described as the culprits of bone metaplasia in polyps in various locations and they have been identified by immunohistochemistry techniques in nasal polyps. In our case, we have applied the available immunohistochemistry techniques without obtaining positive results for specific growth factors. The determination of the TGF β-1, BMP-2, and BMP-4/5 factors could not be completed due to a lack of reagents.

Bone metaplasia has been described in polyps in the gastrointestinal tract with a certain frequency.[3-5] In nasal polyposis, it is an extremely infrequent occurrence, as only 3 documented cases have been reported.[1,2,6] Consideration should be given to whether this low incidence might be due to a low level of diagnosis.

In cases of nasal polyposis, not all the samples resected are systematically sent for histological study, as these are impossible to obtain, on the other hand, when the surgeon makes use of a microdebrider. In addition, it must be remembered that, even if the samples with bone content are sent, it is possible to overlook some of these fragments after a definite diagnosis has been obtained with the analysis of other fragments.

In this specific case, the considerations prior to surgery were aimed at discarding an inverted papilloma, a suspicion based on the unilateral nature and the appearance of the lesion.

The pathology analysis confirmed the definitive diagnosis. When faced with findings of bone included within a mass of nasal polyposis, the differential diagnosis must include bone sequestration, osteoma, long-lasting fungal sinusitis, and ectopic bone formation (metaplasia).

With respect to bone sequestration, destructured fragments of mature bone would be found embedded in polyps or the nasal mucosa, as a result of chronic inflammatory processes with osteitis. Osteoma is a benign tumour developed from bone, and its most frequent location is on the frontal and anterior ethmoid.[7] Fungal sinusitis shows a considerable infiltrate of eosinophils, which did not happen in our case; on the other hand, ossification in fungal sinusitis does not present such a clearly defined trabecular pattern. In the case at hand, the microscopic diagnosis revealed new trabecular bone, thus discarding other processes such as those cited.

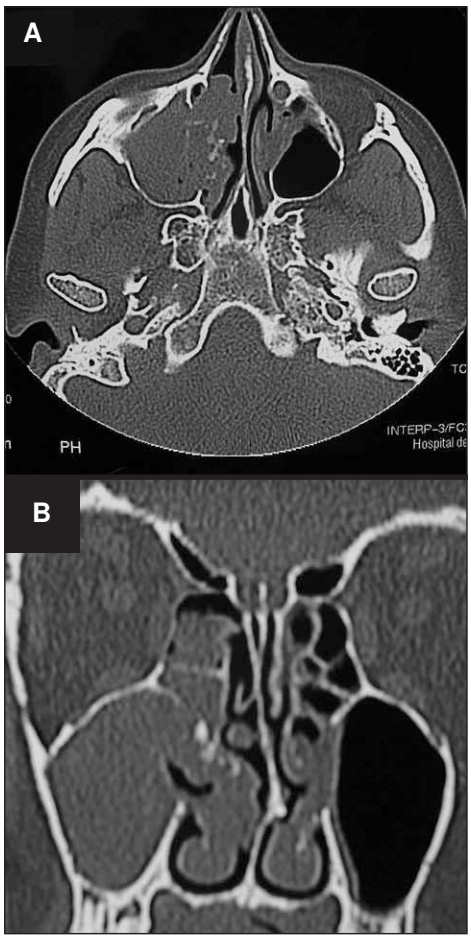

Figure 1. Computerized tomography of the paranasal sinuses. A: axial slice. B: coronal reconstruction.

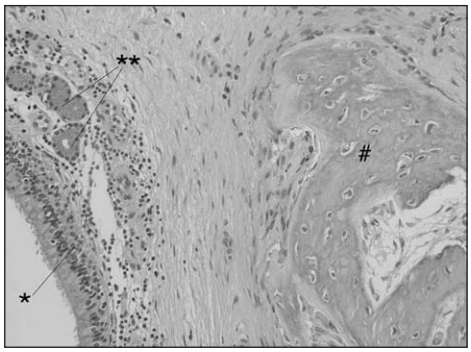

Figure 2. Histopathology (H-E, ×40). *Respiratory epithelium. **Glands. #Metaplastic bony islet.

REFERENCES

1. Jacono AA, Sclafani AP, van De WT, McCormick S, Frenz D. Metaplastic bone formation in nasal polyps with histologic presence of transforming growth factor beta-1 (TGFb-1) and bone morphogenetic proteins (BMPs). Otolaryngol Head Neck Surg. 2001;125:96-7.
2. de Vries N. New bone formation in nasal polyps. Rhinology. 1988;26:217-9.
3. Rothstein RD, liVolsi VA. Metaplastic ossification of a benign colonic polyp. Gastrointest Endosc. 2000;51:254.
4. Haque S, Eisen RN, West AB. Heterotopic bone formation in the gastrointestinal tract. Arch Pathol Lab Med. 1996;120:666-70.
5. McPherson F, Maldonado M, Truitt CA, Mamel JJ, Morgan MB. Metaplastic ossification of a benign colonic polyp: case report. Gastrointest Endosc. 1999;49:654-6.
6. Friedmann J. Miscellaneous granulomas and nasal polyposis. In: Pathology of granulomas and neoplasm of the nose and paranasal sinuses. 1st edition. London: Churchill Livingstone; 1982. p. 23-5.
7. Casado MJ, Ayala ZA, Cantillo BE, Jurado RA. Osteoma y poliposis: una inusual asociación. Acta Otorrinolaringol Esp. 1998;49:491-4.