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II Zakład Radiologii Lekarskiej. Akademia Medyczna w Lublinie
Kierownik: prof. dr hab. Stanisław Bryc
Oddział Laryngologii. Miejski Szpital w Puławach
Kierownik: dr hab. n. med. Roman Czerwonka

Janusz ZŁOMANIEC, Roman CZERWONKA,
Grażyna BIEŃKO-BAKA

Maxillary Fistulas of Dental Origin. The Techniques of Recognizing and Supply

Przetoki szczękowo-ustne. Techniki rozpoznawania i zaopatrzenia

Maxillary fistulas of dental origin constitute a clinical problem occurring especially after the extraction of pathologically changed teeth (3, 4, 12). Different operative techniques are used in their supply (3, 7, 13). The aim of this paper is the diagnostic analysis of own material and assessment of operation results.

MATERIAL AND METHOD

In the years 1974—1994 in the Laryngological Ward of the Municipal Hospital in Puławy there were 27 in-patients, both sexes, aged 23—61, who were operated on for maxillary fistulas perforating to the oral cavity through the tooth-socket. Symptoms lasted from 1 to 14 months. The fistulas most commonly resulted from inflammatory complications of dental roots localised above the base of the sinus, especially granulomas and periradicular abscesses of the first and second molar tooth. In 12 cases the fistulas were caused by cavities after the removal of necrotic teeth, usually adjacent ones.

Clinical diagnosis was confirmed on PA and lateral radiograms of the sinuses, orthopantograms, intraoral occlusal X-rays, CT scans in 8 cases and in endoscopic examinations.

RESULTS

Infection of maxillary sinus occurred in all cases of fistulas revealing itself in most radiograms by a diffuse opacity of the sinus (Fig. 1). In 6 patients it also involved ethmoidal cells (Fig. 2). A unilateral pathology of the base of the sinus in the form of spheric thickenings of polyp-type mucous membrane was found in 14 cases (Fig. 3). In 8 patients cysts of dental roots growing into the sinus were

detected. Irregular thickenings of mucous membrane filling sinus lumen occurred in 5 patients (Fig. 4). Necrotic changes in dental roots most commonly contributed to sinusal infection. Fistulas revealed themselves 7 times right after dental extraction, 4 times after the period of 1—4 months. In 18 cases during the act swallowing fluids got to the nose. In such cases there was usually found endoscopically a wide communication of the maxillary sinus with the nasal duct.

The endoscope was introduced through the fistula usually originated after tooth extraction. There were found polyp changes of the mucous membrane with muco-purulent secretion (Fig. 5). In some cases roots of adjacent teeth were visible, covered only with mucous membrane. Valsalvy test resulted in the passage of air through the tooth-socket visible as air bubbles at the fistula opening. Symptoms of sinusal inflammation, in some cases, contributed to delayed recognition of the fistula.

In the material under discussion, fistulas were treated after previous radical surgery of the maxillary sinus with the Caldwell-Luc's method. After cleansing the fistula of granuloma and uncovering the defect of the dental arch, it was supplied. If bone defect was big on the side of the labial vestibule, it was supplied with a flap of mucous membrane from the cheek. When bone defect of the dental arch on the side of the oral cavity was found, a pedunculated flap of mucous membrane from the hard palate was used. Lasting closure of fistula's lumen was obtained except in one case, which was supplied with a pedunculated flap of buccal mucous membrane in two-stage surgery.

DISCUSSION

The commonest reason of oral-maxillary fistulae is extraction of upper molar teeth (6, 12). In the material under discussion this concerned necrotic teeth found in 44% patients. In 47% cases the first molar tooth was at stake (1). Thickness of maxillary alveolar arch is important in fistula formation. A thin alveolar arch can predispose to fistula formation as well as infection, and wide opening after extraction (12).

As a rule, the inside of the sinus is then infected (12). The inflammatory condition of the maxillary sinus is in all the discussed patients. Secondary breakdown of hemorrhagic clot, associated with infection, and impaired healing of the wound after extraction delay diagnosis of the fistula (1).

Dental etiology was found in 40.6% cases of chronic maxillary sinus inflammations (9). Marginal periostitis and periradicular granulomas made up 83% cases (9). There is emphasized the effect of infectious dental focus having the character of periapical necrotic changes and radicular cysts growing into the sinus on the origin of both fistulas and recurrent inflammations of the maxillary sinus (8, 11, 14, 16). Radicular and periapical empyemas and granulomas may

Fig. 1. Maxillary sinuses with bilateral opacities, not uniform on the right

Fig. 2. In bases of both maxillary sinuses spheric opacities. Ethmoidal cell on the left with opacities

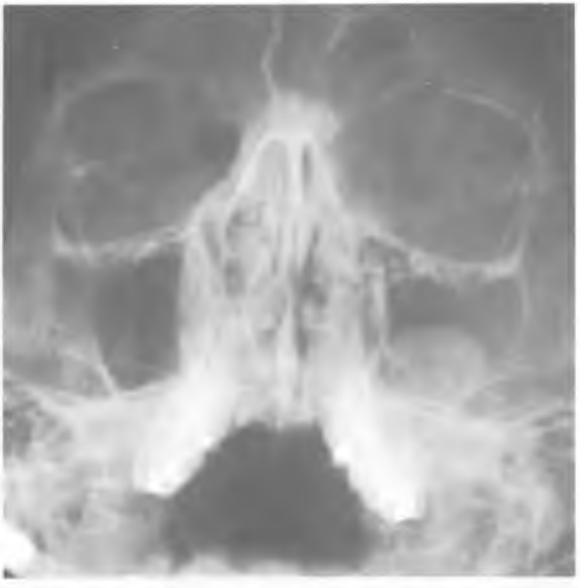

Fig. 3. In the base of the left maxillary sinus a spheric smoothly contoured opacity

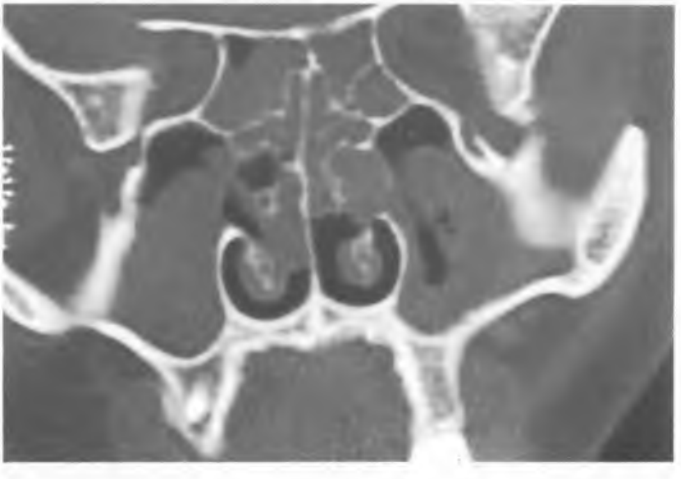

Fig. 4. Maxillary sinuses with opacities except for apical parts. Lack of pneumatisation ef ethmoidal cells

Fig. 5. Oedema and hypertrophies of mucous membrane in chronic inflammation of maxillary sinuses

erode the thin osseous lamella of the tooth-socket and penetrate the sinusal lumen.

Dental etiology of sinusitis can be overlooked at the presence of necrotic teeth that do not give pain reactions. Longlasting fistulas sometimes give scanty symptoms in the retained sinusal drainage. Stasis of secretion, however, resulting from impaired drainage causes relapses of inflammatory conditions. Endoscopically observed blockade of sinusal opening is associated with polypous hypertrophy of the mucous membrane and damages of the ciliary mechanism (10).

Operative findings in inflammations of maxillary sinuses allowed to assess 22—63% of radiograms as false positive ones (14). There is emphasized the usefulness of CT when inflammatory changes involve bony structures of the sinus and tooth-socket (17). In own material CT imaging was indicated when the contours of intensely opaque maxillary sinus were intensely obliterated. The treatment of choice is closing of the oral-sinusal junction. The techiques used depend on the size of the fistula and condition of surrounding tissues (5). Surgically treated fistulas reveal a thickening of the mucous membrane and sinusal polyps in 69% cases (7), while on X-ray these changes were observed in 49% cases (7). In the material under discussion, however, hypertrophic changes of the mucous membrane of maxillary sinuses, especially those localised at its base, were operatively found in 82% cases and radiologically in 74%. Polypus changes of the nasal mucous membrane in sinusal inflammations of dental orgin occurred in 13.1% cases (9). In own material these changes were endoscopically observed in 32% patients.

REFERENCES

1. Amaratunga N.: Oro-antral fistulae — a study of clinical, radiological and treatment aspects. Br. J. Oral Maxillofac. Surg. **24**, 433, 1986.
2. Brown R.: Le sinus maxillaire en odontologie. Méd. Hyg. **42**. 3586, 1984.
3. Carstens M. et al.: A new approach for repair of oro-antral-nasal fistulae. The anteriorly based buccinator myomucosal island flap. J. Craniomacillofac. Surg. **19**, 64, 1991.
4. Chidyllo S.: Intraoral examination in pyogenic facial lesions. Am. Fam. Physician **46**, 461, 1992.
5. Ehrl P.: Oroantral communication. Epicritical study of 175 patients, with special concern to secondary operative closure. Int. J. Oral. Surg. **9**, 351, 1980.
6. Godfrey P.: Sinus obliteration for chronic oro-antral fistula: a case report. Br. J. Plast. Surg. **46**, 341, 1993.
7. Lin P.: Management of odontogenic sinusitis with persistent oro-antral fistula. Ear. Nose. Throat J. **70**, 488, 1991.
8. Marasco P. et. al.: Dentocutaneous fistula. Ann. Plast. Surg. **29**, 205, 1992.
9. Melen I. et al.: Chronic maxillary sinusitis. Definition, diagnosis and relation to dental infections and nasal polyposis. Acta Otolaryngol. **101**, 320, 1986.
10. Rouvier P. et al.: Endoscopie du sinus maxillaire. Rev. Laryngol. **104**, 23, 1983.

11. Sharan R. Choudhary S.: Dentigerous cyst with oro-antral fistula. J. Laryngol. Otol. **93**, 399, 1979.
12. Shultz R. et al.: Herniation of the antral membrane through an extraction site. Report of a case. Oral Surg. Oral Med. Oral Pathology **71**, 280, 1991.
13. Stajcic Z.: The buccal fat pad in the closure of oro-antral communications: a study of 56 cases. J. Craniomaxillofac. Surg. **20**, 193, 1992.
14. Wowern N. von: Clinical and radiographic findings in maxillary sinus with oro-antral fistula. Int. J. Oral Surg. **10**, 138, 1981.
15. Vanclooster R. et al.: Oroantral communication and its treatment. Rev. Belge Med. Dent. **46**, 20, 1991.
16. Vuong L., Buchet R.: Apport de la radiographie panoramique dans l'exploration des sinus maxillaires. J. Radiol. **60**, 783, 1979.

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STRESZCZENIE

W materiale 27 przetok szczękowo-ustnych najczęstszą przyczynę stanowiły zębowe powikłania zapalne okołokorzeniowe i usunięcia martwiczych I—II górnych siekaczy. Towarzyszące stany zapalne zatok szczękowych opóźniające rozpoznanie przetok analizowano w obrazie radiologiczno-endoskopowym. Zaopatrzenie przetok po uprzedniej radykalnej operacji zatoki szczękowej m. Caldwell-Luca wykonywano uszypułowanym płatem błony śluzowej z policzka lub podniebienia twardego w zależności od lokalizacji i wielkości ubytku.