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Facial phlegmon – a case report

The most common reason of oral and visceral cranium nonspecific inflammatory processes is odontogenic infection (2). It can be the outcome of exacerbation of chronic proliferative periodontitis and purulent pulpitis as well as pulp gangrene. Specially in the cases of purulent pulpitis and pulp gangrene, pathogenic microorganism and their toxins penetrating through the apical foramen can be the reason of the dynamic and fulminant course of the disease (4). However, the infectious process may vary depending on the virulence of the microorganism, host resistance and accompanying diseases as well as location (1).

The complicated anatomical structures of the visceral cranium forming several distinct compartments, separated by muscles and fascias, provide favourable conditions for inflammatory process spread as well as for retaining of the suppurative content (2).

The direction of odontogenic infection spread is determined by the relation of the root apices to the adjacent anatomical structures (1, 5). Most maxillary odontogenic abscesses penetrate buccally, because of very thin buccal cortical plate (5). Thus, infection from the maxillary premolars and molars can spread to the buccinator muscle, involve it in the infection and thereafter may spread into the buccal space, or directly involve buccal space dependently on the relationship between the root apex and buccinator attachment (2, 5). Further, via anastomoses of the pterygoid venous plexus with the inferior ophthalmic vein and the superior ophthalmic vein, the infection can reach the orbit. The orbital cellulitis can also be produced by the direct spread. It can be produced by retrograde spread via facial vein as well. The extention of inflammatory process is facilitated by broad communication between the facial and the ophthalmic veins in the canthal region. The 2-way communication between all the specified valveless veins should be highlighted as the factor that facilitates the infection spread in the maxillofacial region (1, 5).

It is reported in the literature that approximately from 10% to 20% of all inflammations of the paranasal sinuses may have odontogenic origin (1, 3), subsequently the orbit is the most commonly reached by the inflammatory process in the next stage of its spread in the soft tissues of the visceral cranium (1).

Anatomical conditions are conductive to odontogenic infection of the maxillary sinus. Its alveolar recess is in direct contact with the premolars and molars root apices. Occasionally, root apices from the second premolar to the third molar teeth, extend over the floor of the maxillary sinus. It can explain the high incidence of inflammatory changes in this part of the maxillary sinus and distinctly indicates odontogenic origin of the pathology (2, 5).

Odontogenic infections can cause multiple complications both regional and general. Extensive infections of the facial soft tissues, involving the orbit and paranasal sinuses can be the result of not

only inflammatory infiltration, or an abscess, but also even small dental inflammatory focus (1, 4). In severe cases infection may also spread from the maxillofacial region further to the cavernous sinus, cerebral meninges and brain, mediastinum and even vertebral canal (4).

For these reasons it is essential to provide proper diagnosis and treatment based on accurate clinical and radiological examination as well as microbiological evaluation (1).

CASE REPORT

A 47-year-old male patient P. D., was referred to the Department of Maxillofacial Surgery of Medical University Hospital in Lublin because of facial phlegmon. On the basis of the patient's medical documentation and anamnesis it was affirmed that the disease had begun at the end of November 2005 with intensive pain of the right maxillary region. In spite of extraction of his tooth 17, performed in the dental office, the pain did not retreat. Additionally, swelling and inflammatory infiltration of the right cheek was experienced. In the regional dental clinic the buccal abscess was diagnosed. It was incised, suppurative content was evacuated and amoxicillin-clavulonic acid together with metronidazol were prescribed. Because of the lack of the improvement, after several days he presented to the same clinic and was qualified for admission to the department of oral surgery. At the admission the patient was subfebrile (37.3°C). Regional inflammatory infiltration was still present. Laboratory examination revealed that the white blood count was 14.8 x 10^3 mm^3 with 69.6% granulocytes, the red blood count was 3.77 x 10^6 mm^3, haemoglobin was 11.5 g/dl, haematocrit was 32.5%. During eleven-day hospitalization of the patient in the department, intraoral and extraoral incisions with drainage were used, together with pharmacological treatment (cefotaxime, metronidazol, amicasin and fluconazole together with other adjuvant drugs). In the first two days of hospitalization there was an increase of the inflammatory infiltration, which involved the right lower eyelid. The puncture and drainage performed in the infiltrated region did not bring any improvement. Ophthalmologic examination carried out at the same time, did not reveal pathological changes within the eyeballs. After microbiological evaluation, ciprofloxacime was administered instead of cefotaxime, according to the culture results. Since the patient's condition during eleven--day hospitalization in the department of oral surgery had not improved, he was transferred to the department of general surgery of one of the city's hospitals. The radiograph of the paranasal sinuses, taken during hospitalization, revealed complete opacification of the right maxillary sinus. During ten-day consecutive hospitalization in the general surgery department there was another extraoral incision of soft tissues performed, the material was sent for culturing and the treatment with metronidazole and ciprofloxacine was continued. Because of the lack of the improvement of the patient's condition, he was transferred to the Department of Maxillofacial Surgery of Medical University Hospital in Lublin. At the admission to the department, the presence of inflammatory infiltration of the buccal soft tissues and of the infraorbital region on the right was affirmed together with incisions of the tissues: two incisions in the infraorbital region and one incision in the lower part of the cheek with drains present in the incisions. At the same time CT was ordered to diagnose the causes and the extent of the inflammatory process. Performed radiological examinations revealed: the presence of tooth root 11 and tooth 16 with chronic periapical inflammatory changes on panoramic radiograph (Fig. 1) and on computed tomography – extensive inflammatory changes involving buccal soft tissues and partially the right orbit, complete opacification of the right maxillary sinus and partial opacification of the right frontal, ethmoid and sphenoid sinuses (Fig. 2, 3, 4, 5). On the basis of clinical examination and radiological diagnosis, the patient was qualified for elimination of potential causes of odontogenic facial phlegmon – extraction of the tooth root 11 and tooth 16 as well as executing broad soft tissues and right maxillary sinus drainage. From the inflammatory infiltration

the material for histopatological evaluation was taken at the same time (the evaluation result: *massae necrotico-purulentae foci parvi. Granulatio non specifica*). Simultaneously antimicrobial therapy was continued (ciprofloxacine 2x200 mg iv, sultamicilline 2x 3g iv, fluconazole 1x50 mg and adjuvant drugs administration), accordingly to the culturing. The applied the treatment enabled distinct improvement of the patient's health condition in several days. In the final stage of treatment revision of the right maxillary sinus was performed, which resulted in the removal of detected chronic inflammatory changes. To continue the drainage, communication of the sinus with the nasal cavity was created at the same time. After several-day hospitalization the patient was discharged from the hospital in good general and local condition.

Fig. 1. Panoramic radiograph showing carious first upper right molar and the root of the central upper right incisor with the signs of chronic periapical inflammatory changes

Fig. 2. Axial image with completely opacificated, inflammatory right maxillary sinus, filled with a content of suppurative density. Involvement of the facial soft tissues of the same side

Fig. 3. Axial image with an indentation of the inflammatory changes from the right maxillary sinus to the nasal cavity. Note the facial soft tissue thickening and heterogeneity

Fig. 4. Coronal image of the right orbital cellulitis, with involvement of the floor, inferolateral aspect of the orbit, lateral and inferior rectus muscles. Right maxillary and ethmoidal sinusitis

Fig. 5. Coronal image of inflammatory infiltration and gas in facial soft tissues

CONCLUSIONS

In the analysis of the presented patient's disease course, two main factors may be noticed, which could have a fundamental impact on the prolonged suppurative process. The first factor could be the teeth with chronic apical periodontitis left in the alveolar process. The second factor could be the chronic inflammatory process of the maxillary sinus, left without surgical intervention and drainage.

In the treatment of suppurative processes of visceral cranium, the most common of odontogenic origin, aside from clinical examination, the accurate radiological and microbiological evaluation is essential in order to determine potential causes of the inflammatory process and initiate proper pharmacological treatment. Establishment of the location and effective drainage are crucial as well. This kind of management enables to avoid serious consequences of the visceral cranium inflammatory process.

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SUMMARY

Odontogenic inflammatory processes are the cause of high percentage of maxillofacial infections. In order to avoid serious consequences of the pathology, early and accurate diagnosis, including radiological evaluation and decisive treatment is mandatory. In the paper, the case of extensive odontogenic infection originating in the maxillary teeth is presented. The patient was unsuccessfully treated for facial cellulitis in two different surgical departments, prior to his final transfer to the Department of Maxillofacial Surgery of the Medical University of Lublin. The suppurative inflammatory process embraced the right buccal soft tissues, orbit and maxillary sinus with pathological changes in the nasal cavity, ethmoid, sphenoid and frontal sinuses of the same side. After prompt diagnosis and applied treatment, both surgical and pharmacological, complete recovery of the patient was achieved.

Ropowica twarzy – opis przypadku

Zapalne procesy zębopochodne stanowią przyczynę dużego odsetka infekcji szczękowo-twarzowych. W celu uniknięcia poważnych konsekwencji tej patologii obowiązkowa jest wczesna i dokładna diagnostyka, w tym radiologiczna, i zdecydowane leczenie. W pracy przedstawiono przypadek rozległego zębopochodnego zakażenia wywodzącego się z zębów szczęki. Pacjent leczony był bez powodzenia z powodu ropowicy twarzy w dwóch różnych oddziałach chirurgicznych przed jego przeniesieniem do Kliniki Chirurgii Szczękowo-Twarzowej Akademii Medycznej w Lublinie. Zapalny proces ropny objął tkanki miękkie prawego policzka, oczodół i zatokę szczękową ze zmianami patologicznymi jamy nosowej, sitowie, zatoki klinową i czołową po tej samej stronie. Po bezzwłocznej diagnozie i zastosowanym leczeniu, zarówno chirurgicznym jak i farmakologicznym, uzyskano całkowite wyleczenie.