SAPHO syndrome with affection of the mandible: diagnosis, treatment, and review of literature

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SAPHO syndrome is a rare syndrome of unknown etiology. Involvement of the mandible is found in almost 10% of cases. In the literature, conservative treatment is recommended most often, because decortication and partial resection are found to be ineffective and of temporary profit. We report a case of SAPHO syndrome in a 44-year-old women with unilateral hyperostosis of the mandible and massive painful swelling of the surrounding soft tissues. Owing to facial disfiguration and pain, resection of the affected bone followed by immediate reconstruction with a microvascular iliac crest flap were performed. The aim of this paper was to present the necessity of surgical intervention in SAPHO syndrome of the mandible in cases of esthetic and functional limitation. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;111:190-195)

SAPHO is the acronym for the most common symptoms—synovitis, acne, pustulosis, hyperostosis, and osteitis—of a syndrome first described by Chamot et al.1 in 1987. SAPHO syndrome is not an independent ailment, but a combination of symptoms.2 The disease is rare and seldom appears with the synchronous combination of osteoarticular and skin manifestations.3 Moreover, not all of these symptoms necessarily occur, and each may be seen at a different time.4 Bone manifestation is typically characterized by nonsuppression and a mixed radiographic pattern accompanied by solid type periosteal reaction, external bone resorption, and bone enlargement. The presence of skin diseases, such as palmoplantar pustulosis, strongly suggests SAPHO syndrome.4

Reports on affected jaws are rare, although some authors1 discuss the involvement of the mandible in 10% of patients suffering from SAPHO syndrome. It is also not quite clear whether diffuse sclerosing osteomyelitis is its own entity or one manifestation of SAPHO syndrome.5-9 However, the mandibular bone is the most painful site that can be affected by this type of recurrent osteomyelitis.10

CASE REPORT

A 44-year-old woman presented with recurrent, increasing pain of the left mandible and the surrounding soft tissues. Clinical examination revealed swelling of the left mandible and restricted mouth opening. There was no evidence for dental foci that could have caused the clinical findings. A panoramic radiograph showed an enlargement of the corpus and ramus of the left mandible (Fig. 1). Computerized tomography scans revealed a diffuse appositional bony growth totally surrounding the corpus and angle of the left mandible (Figs. 2 and 3). There were no effects on the temporomandibular joint (TMJ) or the mandibular condyle (Fig. 4). Scintigraphy showed considerable enhancement in the left mandible, as well as in the sternum and the sternocostal and sternoclavicular joints (Fig. 5). At this time the patient did not complain about any skin abnormality.

The patient was referred to the Department of Rheumatology for complete rheumatologic evaluation. Blood samples were unremarkable, with no signs for inflammation and values for HLA-B27 antibodies and rheumatoid factors in the normal range.

There are no standard guidelines in treatment of SAPHO syndrome. Most authors suggest conservative treatment, but some recommend surgical intervention. We present a case of SAPHO syndrome of the left mandible. The affected bone was resected and simultaneously reconstructed with a microvascular iliac crest flap.
Postoperatively, the patient was administered antibiotics (clindamycin) and nonsteroidal antiinflammatory drugs (NSAIDs). Additionally, the patient underwent 40 cycles of hyperbaric oxygen therapy. During that time, a reenlargement of the left mandible occurred and the patient complained about increasing pain and paresthesia of the left lower lip. After 6 weeks, a panoramic radiograph showed almost the same enlargement as before surgery. SAPHO syndrome was then diagnosed, because the patient presented palmoplantar pustulosis (Figs. 7 and 8). A repetition of the decortication and neurolysis were taken into account as possible strategies, but the chance of recurrence was thought to be high. Furthermore, the worsening mandibular asymmetry concerned the patient, who also suffered from increasing pain. Therefore, a total resection of the affected bone with preservation of the inferior alveolar nerve was the treatment of choice.

During surgery, sclerosis of the mandible was found reaching from the lower right canine tooth up to the cranial part of the mandibular condyle (Fig. 9). For immediate reconstruction, a free iliac crest flap was raised and anastomized to the superior thyroid artery and the external jugular vein. The transplant was affixed by a reconstruction plate (Fig. 10). Temporarily, intermaxillary fixation ensured a correct occlusion. After surgery, the patient was ordered a low-dose corticosteroid therapy by the rheumatologist.

Fig. 1. Panoramic view: Enlargement of the left mandible with diffuse sclerotic aspect.

Fig. 2. Diffuse sclerotic enlargement of the left mandible.

Fig. 3. Massive enlargement of the mandible and swelling of surrounding soft tissue.

Fig. 4. The temporomandibular joint and the mandibular condyle are found to be inconspicuous.
After a follow-up period of 2 years there were no symptoms of the SAPHO syndrome and a limited paresthesia of the left lower lip remained.

**DISCUSSION**

For the search term “SAPHO syndrome,” the Pubmed database delivers 360 results from between the years 1987 and 2010. Adding the term mandible, 18 results are found, mainly case reports. According to Chamot et al., who was the first to describe SAPHO syndrome, the mandible is affected in 10% of cases. Kahn et al. concluded, after analyzing 7 cases of SAPHO syndrome with an affected mandible, that diffuse sclerosing osteomyelitis of the mandible may be a part of the disease. The treatment of SAPHO syndrome is empirical and based on anecdotal experiences or small control studies; there are currently no guidelines, so the

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**Fig. 5.** $^{99}$Tc Scintigraph showing considerable enhancement in the left mandible, the sternum and the sternocostal and sternoclavicular joints.

**Fig. 6.** Reactive bone lesions with areas of cortical and subcortical bone remodelling, defects caused by cortical resorption and inflammatory cells in the subcortical area (hematoxylin-eosin; $\times40$).

**Fig. 7.** Plantar pustulosis as a part of SAPHO syndrome.
treatment for SAPHO syndrome has focused mainly only on symptoms.21 Treatments that are thought to be beneficial for SAPHO syndrome include NSAIDs and analgesic agents, which may have limited efficacy.13 Although not in all bone biopsies, Propionibacterium acnes could be identified, and a causal connection of SAPHO syndrome with the presence of *P. acnes* has been discussed.14 Therefore, antimicrobial treatment is recommended. However, inefficacy of antibiotic therapy suggests that the inflammatory process is not septic and, *P. acnes* may act as an antigen provoking an immunologic reaction.15 This is in accordance with Suei et al.,4 who argue that the effectiveness of corticosteroids for palliation, without simultaneous administration of antibiotics, could indicate the possibility of a noninfectious origin. On the other hand, many authors report the usefulness of tetracycline, clindamycin, and macrolides.2,22,30 Biphosphonates are also mentioned as effective: Amital et al.16 presented a study of 10 adult patients suffering from SAPHO syndrome. In 6 patients, a complete remission of the disease was observed after treatment with pamidronate infusions; 3 patients partially responded to the therapy, and only 1 patient had no response. Accordingly, Kerrison et al.17 published the effectiveness of pamidronate in 7 girls. Ichikawa et al.20 reported a case of successful treatment of SAPHO syndrome by using oral biphosphonates. This may reduce the risk of possible side effects of intravenous application of biphosphonates, such as osteonecrosis of the jaws.18,19

Out of 18 papers concerning mandibular involvement of SAPHO syndrome, only 14 publications mention which therapeutic strategies were adopted. Out of a total of 49 patients, 20 received surgical treatment and 29 patients were treated conservatively. It is not always clear if some of the patients are repeatedly mentioned in literature, because some of the authors reported on the topic of SAPHO syndrome in several publications.

In most cases, the corpus and ramus of the mandible were affected. Research of the literature revealed only 4 cases of involvement of the TMJ, which seems to be surprising, because synovitis is a main symptom of SAPHO syndrome. Müller-Richter et al.2 reported a case of ankylosis of the TMJ resulting in resection of the condyle and reconstruction with an alloplastic implant. In a similar situation, Utumi et al.22 performed a bilateral high condylectomy and coronoidectomy to correct the mouth opening limitation, whereas the hyperostosis of the corpus was treated with corticosteroids. Eyrich et al.23 combated an affected TMJ and mandibular corpus surgically, resecting the ascending ramus and the condyle of the mandible. The defect was reconstructed by a rib graft. In the fourth case, Marsot-Dupuch et al.24 reported SAPHO syndrome of the TMJ resulting in sudden deafness: the lesion affected the mandibular condyle as well as the temporal squama, extending posteriorly to the petrotympanic suture. The patient was treated conservatively using NSAIDs. Besides these cases, there are several reports of inflammatory

![Fig. 8. Palmar pustulosis as a main symptom of SAPHO syndrome.](image1)

![Fig. 9. During surgery, the mandible was found to be affected from the right canine region up the the left ascending ramus.](image2)

![Fig. 10. Mandibular defect reconstructed with microvascular iliac crest flap.](image3)
effect on the TMJ in patients suffering from rheumatic diseases. Speculatively, these cases could also be undiagnosed cases of SAPHO syndrome. In patients with involvement of the mandibular corpus and ramus, only 17 patients out of 45 underwent surgical treatment; the affected mandible was mostly decorticated, in some cases several times. Most patients received additional antibiotics, antiinflammatory drugs, and hyperbaric oxygen therapy.

Suei et al. reported 4 cases of diffuse sclerosing osteomyelitis: In all of the patients, partial resection of the mandible was performed with temporary effect. Roldán et al. reported a case of SAPHO syndrome with 7 ineffective decortications; therefore, they do not recommend surgical intervention, because it is against the general consensus.

The authors of the present paper agree with this point of view and consider radical surgical interventions to be ultimate treatment only in cases of limited function (such as restricted mouth opening), defacement, increasing pain, and failure of conservative treatments. In the present case, the left mandible was decorticated and contoured unsuccessfully, and recommended therapies, such as hyperbaric oxygen therapy, antibiotics, and antiinflammatory therapy, were ineffective. Therefore, a resection of the left mandible was performed.

The choice of the donor site for mandibular reconstruction could be an matter of debate in SAPHO patient undergoing microvascular transfer, because the most commonly used bone donor sites could also be affected by osteomyelitis. According to the literature, long bones are affected by SAPHO syndrome in 30% of cases, mostly involving the distal femur and the proximal tibia, whereas flat bones, such as the ilium, are part of the disease in only 10% of cases. Reviewing the literature, 1 case of fibular affection and 1 case of isolated iliac crest manifestation of the syndrome could be found. The sacroiliac joints are affected more often. Anyway, affection of the donor site should always be excluded by 99Tc scintigraphy. However, a theoretic risk of future affection of the transplanted bone can not be excluded.

CONCLUSION

SAPHO syndrome is a chronic disease on unknown origin. Up to now, it is unclear if a diffuse sclerosing osteomyelitis of the mandible is part of the syndrome. In 10% of SAPHO syndrome patients, a mandible involvement can be observed. Primarily, conservative treatment with NSAIDs and corticosteroids is recommended. Hyperbaric oxygen therapy may be useful, and minor surgical procedures such as decortication and curettage are mentioned as ineffective. Wide resection of the affected mandibular bone and immediate reconstruction using microvascular flaps seems to be recommended in case of deformity, loss of function, increasing pain, and failure of conservative treatments. Osteomyelitis of the donor site has to be excluded by scintigraphy.

REFERENCES


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