SAPHO Syndrome – Rare Case of Joint Damage Treated By Knee Synovectomy and Total Hip Joint Replacement

SAPHO syndrom – ojedinělý případ řešení kloubních postižení synovektomií a endoprotézou

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SUMMARY

This report describes the case of a young male who had been followed-up between the ages of 14–21 years at different health facilities for symptoms initially considered to be caused by tumor, then by chronic osteomyelitis or ankylosing spondylitis and finally diagnosed as the SAPHO syndrome. Musculoskeletal symptoms of the SAPHO syndrome include focal, probably aseptic chronic osteomyelitis, synovitis and formation of hyperostoses. Therapy of the SAPHO syndrome is predominantly conservative. However, in this case we had to employ arthroscopic synovectomy first, for severe synovitis resistant to any conservative therapy approach. Later, left total hip replacement has been performed for advanced hip joint damage accompanied by intense pain and significant range of motion reduction.

At the present time, the patient is $5^1/_2$ years after synovectomy of the knee and 5 years after the hip joint replacement. The knee joint is without effusion or functional limitations, with intermittent pains only. The hip prosthesis in the risk area is fully integrated without signs of component loosening, with very good functional outcome. While synovectomy can be obviously fully recommended in cases like this, the total joint replacement should be considered unique and indicated only rarely after careful consideration of all circumstances. We consider this approach absolutely exceptional also because we have not found reference to similar case in any national or international professional literature available.

Key words: SAPHO syndrome, chronic osteomyelitis, knee synovectomy, total hip joint replacement.

INTRODUCTION

The term SAPHO has been used since 1987 for a syndrome characteristically affecting the synovial membrane, bones and skin (2). It is an acronym formed from initial letters of the words denoting the main symptoms: S- synovitis, A- acne, P- pustulosis, H- hyperostosis, O – osteitis. Not all of the symptoms have to be present simultaneously.

Diagnostic criteria (Tab. 1) are fairly complicated (1). However the main manifestation is osteoarticular involvement, which is included in all four sets of criteria. The second component is skin involvement (dermatosis). Primary purulent infection has to be absent in order to fulfill the diagnostic criteria.

Under the term „osteoarticular involvement“ the following is considered: focal osteitis which is a localized inflammatory process of the bone and the bone marrow characterized by a lymphocytar infiltration during the acute stage, which leads quickly to sclerotization and osseous tissue hypertrophy often accompanied by periostitis and periosteal hyperostosis. The process may initially resemble osteomyelitis or osteolytic lesion on X-ray, later it has osteosclerotic appearance. The number of such lesions is usually rather limited, with the exception of chronic multifocal osteomyelitis (CRMO) a form of the disease seen in children. The bone lesions are often localized in proximity of the affected joint. However both processes are separate. The most common loca-

Tab. 1

SAPHO Syndrome Criteria
1. Osteoarticular symptoms associated with acne 2. Osteoarticular symptoms associated with palmo-plantar pustulosis 3. Chronic multifocal osteomyelitis (with or without dermatosis) 4. Hyperostosis (with or without dermatosis)
Exclusion Criteria: the presence of septic osteomyelitis, septic synovitis, infectious (purulent) pustulosis, palmo-plantar keratoderma, or DISH (Diffuse idiopathic skeletal hyperostosis) **Diagnosis is supported:** by the presence of psoriasis, inflammatory bowel disease signs of ankylosing spondylitis, or low-virulence bacterial infection.

lizations are clavicle, vertebrae, area of the sacroiliac joint and pubic symphysis, long bones and mandible. Osteitis may be asymptomatic, may be a source of pain and pressure during acute phases. A bulge of the bone caused by periostitis and hyperostosis may be apparent clinically.

Arthritis is usually in the form of asymmetrical oligoarthritis. It is an aseptic synovitis with lymphocytar infiltration and with a low tendency toward joint cartilage destruction. Axial skeleton is most commonly affected – spondylitis, spondylodiscitis, sacroileitis, sternoclavicular, sternocostal and manubriosternal joint arthritis. Peripheral joints are affected less commonly.

Skin involvement may be represented by a typical palmo-plantar pustulosis or severe acne (acne pustulosa, conglobata, ulcerans, fulminans).

There is no specific laboratory marker to support the diagnosis. About 13 % of the patients are HLA B27 positive, association with no other MHC antigen has been found. The disease is not associated with the presence of autoantibodies. Acute phase reactants (ESR, CRP) are usually elevated during the acute stage. Culture of material obtained from the osteolytic lesion is usually sterile, in some cases Propionibacterium acnes was found (3, 4, 10). Bone scintigraphy and MRI play a role in the diagnosis of osteitis and in the detection of osteitic lesions (10).

Establishing of correct diagnosis is sometimes difficult and may take even several years. Therapy is predominantly conservative – antibiotics, NSAIDS, sulfasalazine and others are used.

Under the circumstances we have opted for an exceptional surgical treatment of joint involvement in our case, the long-term results of which we would like to present here.

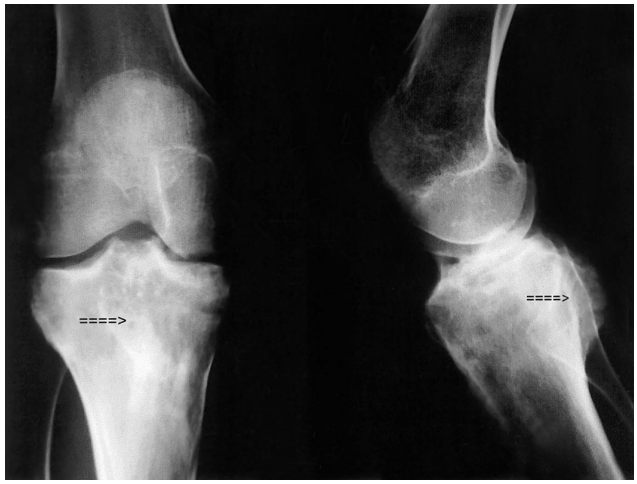

Fig. 1. Osteitic changes in medial condyle of right tibia, initially considered to be a tumor

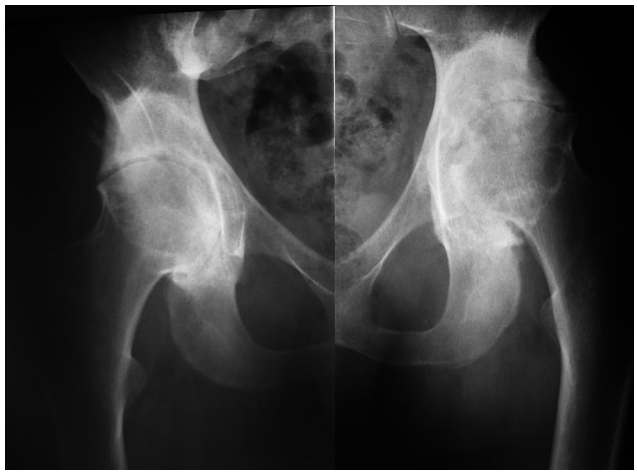

Fig. 2. Supra-acetabular sclerosis and cartilage destruction of hip joints

CASE DESCRIPTION

Our patient, a young man, was first seen in December 1993, at the age of 14 years, in a local hospital for pain and swelling of the right knee. At the same time he had experienced a spread of itchy pustules filled with clear fluid on the palms of both hands. There were transient low-grade fevers around 37.5 degree Celsius. A sclerotic lesion and hyperostotic changes of the metaphysis of right tibia were seen on an X-ray (plain radiograph) (Fig. 1). Subsequent bone scintigraphy confirmed the findings and showed additional focus of increased activity in the proximal half of the right clavicle. Inflammatory markers: CRP within normal limits, ESR 10/hour, ASLO 600. Patient was transferred to a specialized orthopedic department in 1994 with a suspicion of malignity, where a biopsy was performed. Two independent pathologists found only non-specific inflammatory changes. The diagnosis was chronic osteomyelitis without further specification. Patient was treated with antibiotics (Dalacin clindamycin, Oracef cephalexin) for a total of 6 weeks and discharged. Mild knee pain persisted. He was receiving a symptomatic treatment with NSAIDS. After another 4 years, pain at rest in the hips and sacral area appeared, which despite treatment at the local orthopedic facility worsened and since the beginning of the year 2000 patient was able to walk with underarm crutches only. Scintigraphy revealed activity in right tibia, right sternoclavicular joint, both hips and right SI joint. The markers of inflammation except for a mildly elevated ESR of 10/hour were within normal limits.

The patient was admitted to the Institute of Rheumatology in September 2000 for a suspicion of ankylosing spondylitis. At the time of admission he had acne in the face, pustules on both palms, non-tender swelling of the right sternoclavicular joint, swelling of the right knee, painful, with the range of motion of 5–100 degrees. Range of motion in hip joints was: flexion 5–80 degrees on the left, 0 -100 degrees on the right, internal rotation impossible bilaterally, external rotation 30 degrees bilaterally. The movements were very painful especially on the left side. Laboratory parameters: ESR 38/hour, CRP 30, ELFO: elevation in the alpha 2 globulin fraction. The rest of laboratory results were wit-

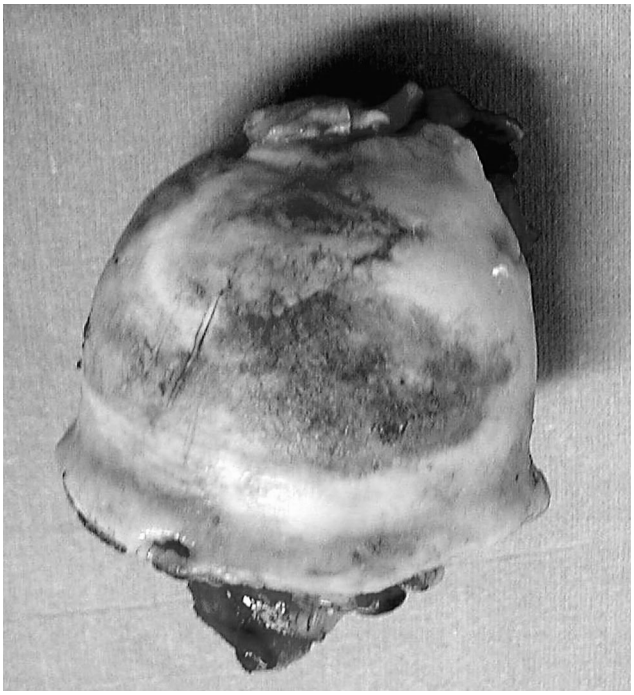

Fig. 3. Resected deformed head with severely damaged cartilage

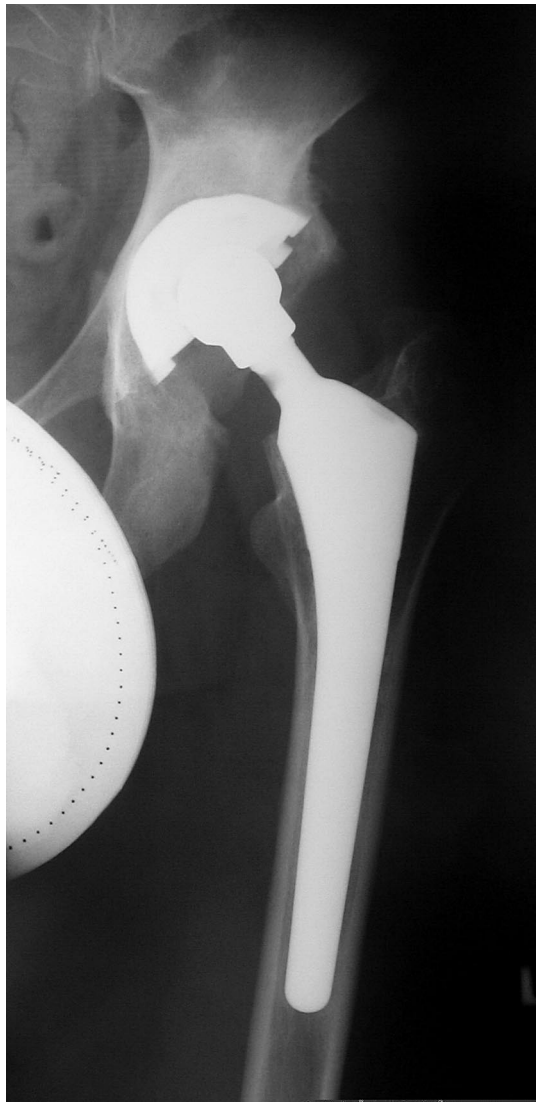

Fig. 4. Fully integrated non-cemented implant 5 years after the surgery

hin normal limits. Immunological tests including HLA B27 were negative. Synovial fluid obtained from the right knee: 1500 WBCs, Differential count: Neutrophils 20 %, Lymphocytes 36 %, Monocytes 40 %. Cultivation revealed sporadic Staphylococcus aureus.

X-ray: sclerotic and remodelation changes found in proximal part of right tibia, both SI joints and both clavicles, where hyperostosis and sequestration dominated. Sclerotic changes were apparent in both hips on femoral heads and supraacetabular area with a marked joint space narrowing. The findings were more severe on the left side (Fig. 2). Scintigraphy and CT have then confirmed these changes.

MRI of the hips revealed synovitis with a marked effusion bilaterally and severe destruction of the cartilage on the left.

The patient was treated with ofloxacine 200 mg BID for 6 weeks. Repeated cultivation of the synovial fluid was negative. The diagnosis of SAPHO syndrome was made. Subsequently a symptomatic treatment with NSA sulfasalazine was initiated which was tolerated well by the patient. At this time the option of a joint replacement was considered, but not indicated for an increased risk of infectious complications.

There was worsening of effusion in the right knee in the middle of 2002, repeated arthrocenteses were needed. Range of motion was 10–90 degrees, the joint was mildly warmer but a chronic pain at rest caused by the pressure of effusion was severe. After repeated negative cultivations a glucocorticoid was injected into the joint without significant improvement. Therefore an arthroscopic synovectomy of the right joint was performed in July 2002. Moderate chondropathy of joint surfaces, minimal delamination of menisci and marked synovitis without other structural changes were seen perioperatively. Histology revealed only mild non-specific inflammatory changes of the synovial membrane. Cultivation was negative. Practically full range of motion was restored after rehabilitation , subjective complaints were significantly improved and the effusion resolved.

After the synovectomy, severe pains mainly in the left hip joint, which not only severely limited walking but were also causing distress at rest and interfered with sleep, dominated the clinical picture. After careful consideration of all circumstances and risks, total joint replacement surgery of the left hip was performed in February 2003, using non-cemented endoprosthesis with porous surface.

Severe synovitis was seen perioperatively with a large amount of clear synovial fluid in the joint, severely deformed femoral head (Fig.3) and completely denuded joint surfaces. The bone was highly sclerotic and nec-

rotic foci were apparent in the head on section. Histology showed, in addition to thickening of bone trabeculae, foci of necrosis and minimal inflammatory infiltration. Cultivation of the synovial fluid, membrane and bone was negative. During the surgery and during the following 6 weeks the patient was covered with a broad-spectrum antibiotic (Zinacef cefuroxime i.v, 1.5 g BID i.v., followed by Zinnat cefuroxime axetil 500 mg. BID i.v.). The surgery and subsequent rehabilitation with unloading of the operated extremity for 6 weeks were uneventful. At the present time (i.e. January 2008) the patient is 5 years after hip joint replacement and 5 1/2 years after synovectomy of the knee. The patient is satisfied with the outcome of both surgeries. The knee is painful only with severe loading. The effusion has not reappeared and the degenerative changes of the knee joint have not progressed on X-ray. The hip is without pain and, given the need to spare the affected right lower extremity, under maximal load. The range of motion is practically within normal limits. Full integration of components without any radiolucency is apparent on the X-ray (Fig. 4).

DISCUSSION

There is a rich body of literature concerning the SAPHO syndrome available at present, which for the most part deals with its differentiation from other conditions with similar chronic musculoskeletal symptoms, especially different types of chronic osteomyelitis (7,14,15). The diagnosis itself is associated with considerable difficulty and it is quite common for the skeletal and joint symptoms to be misdiagnosed as a manifestation of another rheumatic disease, different types of chronic osteomyelitis or a tumor initially (5,15). Opinions differ whether the osteomyelitis is aseptic (3,7) or if there are Propionibacterium acnes bacteria present at affected sites (4,10).

Surgical treatment is mentioned in the literature in association with removing bone sequesters and osteomyelitis lesions in the jaw and vertebral bodies. We were able to identify only one description of a surgical treatment of the SAPHO syndrome consequences at different site (12), in which case a joint replacement of sternoclaviocular joint was performed. Only short-term results were evaluated.

We have hesitated for a long time and opted for a surgical treatment only after exhausting all conservative measures.

To perform the synovectomy of the knee joint was easier since this is the standard approach in other infectious processes as well (13). It was not clear whether it would be successful long-term also in a case of SAPHO syndrome. We have shown practically that synovectomy may help to reduce the symptoms and to slow down joint destruction.

The decision regarding total joint replacement was more difficult not only given the patients age but mainly due to the uncertain role of Propionibacterium acnes in the whole disease process.

If we admit that the infectious agent is present directly at the site of involvement, then endoprosthesis is clearly contraindicated (11). In this difficult situation after considering all circumstances we have tended to believe that the process in the bone is of a reactive nature without direct presence of the infectious agent (2,3,7). An utmost care was nevertheless needed because the endoprosthesis might be endangered by a hematogenously spread infection from the skin involvement for instance. In our experience, based on a large cohort of patients with joint replacement, it shows that skin as a source of infection and Propionibacterium acnes acting as a pathogen causing hematogenous infection of endoprosthesis are rather rare (9). The question remains regarding the ability of affected bone to grow into the porous surface of the implant or its reaction to the cement fixation. Unfortunately, despite significant effort we were unable to identify any literature describing experience with a similar case. After considering all circumstances we chose a non-cemented implant, given its better ability to preserve vitality of the bone in its proximity. The patient was informed in detail about all the risks involved and specifically about the possibility of failure and subsequent need for a removal of the implant. Because the patient was having continual pain and even short distance walking was difficult he insisted on the surgical option and pressed for its early realization. We have tried to decrease the risks by a long-term administration of antibiotics after the surgery using the same route and doses used during re-implantations after joint prosthesis infections (6,8,13). Our five-year results show that this approach is feasible. The results of cultivation of resected tissues and perfect postoperative integration of the implant do not indicate local presence of an infectious agent. Otherwise, loosening of the implant and its failure would clearly occur after five years.

CONCLUSION

Our case illustrates that synovectomy might be an effective option in the treatment of chronic joint effusion in SAPHO syndrome and that it probably slows down the joint destruction process. It should be considered safer and more effective than repeated arthrocenteses. However, the total joint replacement remains a last resort in extreme situations. The risk of failure is high. Our case demonstrates that this option is possible, but we cannot under any circumstances infer that it is also safe. The indication must be strictly individual and a patient has to be followed-up regularly after the surgery on a long-term basis, and there has to be an alternate plan in case of failure of the endoprosthesis. The actual risks would become apparent only after evaluating more cases like this in the future.

ZÁVĚR

Kazuistika popisuje případ mladého muže sledovaného od 14 do 21 let na různých pracovištích pro příznaky považované nejprve za tumor, později chronickou

osteomyelitidu a M. Bechtěrev, až po stanovení definitivní diagnózy SAPHO syndrom. Projevy SAPHO syndromu na pohybovém aparátu jsou fokální, zřejmě aseptická chronická osteomyelitida, synovialitida a tvorba hyperostóz. Léčba SAPHO syndromu je většinou konzervativní. V prezentovaném případě jsme však byli nuceni pro těžkou synovialitidu, rezistentní na veškerou konzervativní terapii, sáhnout nejprve k artroskopické synovektomii pravého kolena. Později pro pokročilou destrukci kyčelního kloubu, provázenou silnými bolestmi a těžkým omezením pohybu, byla implantována náhrada kyčle vlevo.

V současnosti je pacient 5,5 roku po synovektomii kolena a 5 let po implantaci endoprotézy kyčle. Kolenní kloub je bez výpotku a omezení funkce, jen s občasnou bolestivostí. Endoprotéza kyčle je v rizikovém terénu plně integrována bez známek uvolnění komponent a s velmi dobrým funkčním výsledkem. Zatímco synovektomii lze v těchto případech zřejmě plně doporučit, indikaci endoprotézy je nutno považovat za zcela ojedinělou a přistoupit k ní pouze výjimečně, po zvážení všech okolností. Za zcela výjimečné považujeme toto řešení i proto, že v nám dostupné, domácí ani světové odborné literatuře jsme nenalezli popis obdobné zkušenosti.

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