CASE REPORT

The 'hidden' SAPHO syndrome

Frances Carr

Department of Geriatrics,
University of Alberta,
Edmonton, Alberta, Canada

Correspondence to

Dr Frances Carr,
franthestar50@gmail.com

SUMMARY

A 64-year-old woman presented to our clinic with a 4-year history of cognitive decline. The clinical examination revealed an incidental finding of the 'SAPHO' (Synovitis Acne Pustulosis Hyperostosis Osteitis) syndrome which was subsequently confirmed by diagnostic imaging. Owing to her classical presentation and her asymptomatic status she was managed conservatively with observation without any complication.

BACKGROUND

The Synovitis Acne Pustulosis Hyperostosis Osteitis (SAPHO) syndrome is an uncommon diagnosis which we had not previously encountered. Although a wide spectrum of clinical presentations have been previously described for SAPHO, they have always been in association with one or more of the classical dermatological or osteoarticular manifestations. The SAPHO syndrome has also been described in patients presenting with unrelated systemic conditions, most commonly including inflammatory bowel disease. This is the first time this condition has been described as an incidental finding in an otherwise asymptomatic individual, which highlights its uniqueness and the educational importance as a case report.

CASE PRESENTATION

A 64-year-old woman was referred to our outpatient clinic for assessment of a 4-year history of cognitive decline. Apart from the cognitive decline and an isolated episode of fleeting 'chest pain' which had lasted for several seconds 1 week prior, she was otherwise asymptomatic. Specifically, she denied any bone pain, arthralgia or arthritic symptoms, skin changes or rashes affecting the face, palms or soles, gastrointestinal symptoms, changes in bowel pattern or constitutional symptoms (ie, fever, night sweats or weight loss). Her medical history was negative for any dermatological conditions (psoriasis, acne or other dermatological conditions), spondylarthropathies or other rheumatic conditions, autoimmune diseases, inflammatory bowel disease or malignancy.

Her medical history included Hashimoto's disease and depression. Current medications included levothyroxine 50 µg daily and escitalopram 10 mg orally daily. Her family history was positive for Alzheimer's disease only.

Prior to admission she had been living alone and was independent functionally and with mobility. She had never married. She was a non-smoker and did not consume alcohol or recreational drugs. She was a retired lawyer.

Physical examination revealed an alert, comfortable and thin woman. Her vital signs were unremarkable (blood pressure 138/75, pulse 66 bpm, respiratory rate 16 breaths/min and oxygen saturations of 98% on room air, temperature 36.4°C). Pertinent positive findings included a visible diffuse swelling with indistinct margins over the left sternoclavicular junction (SCJ) with tenderness elicitable during palpation. However, the absence of any palpable swelling limited the ability for accurate size determination. Other features of inflammation were absent.

Pertinent negatives revealed an absence of classical skin changes (ie, acniform or pustular rashes) affecting the face, palms, soles of the feet or elsewhere. The rest of the physical examination including gastrointestinal, neurological, cardiovascular and respiratory and lymph node examination were unremarkable. Cognitive testing revealed a Mini-Mental Status Examination of 16 of 30, which was suggestive for a diagnosis of moderate dementia.

Owing to this new dementia diagnosis which had not been previously investigated and significant safety concern regarding her current living situation, the decision was made to admit her to hospital for further assessment.

INVESTIGATIONS

Initial laboratory investigations revealed an elevated erythrocyte sedimentation rate (ESR) of 28 mm/h and a C reactive protein (CRP) of 12 mg/L. The rest of the laboratory investigations, which included complete blood cell count and differential, alkaline phosphate, calcium, phosphate, electrolytes, renal panel and antinuclear antibodies, serum and urine electrophoresis which were all normal. Additional investigations performed included coagulation studies, magnesium, albumin, liver enzymes, vitamin B₁₂, vitamin D, thyroid stimulating hormone, ferritin, troponin I and creatine kinase which were all normal.

Owing to the presence of elevated inflammatory markers and a history of fleeting chest pain further investigations were performed. These included a normal ECG and a chest X-ray. The chest X-ray revealed a 2.4 cm irregular mass in the left apex which was further defined by a chest CT which revealed evidence of a severe arthropathy affecting the left sternoclavicular joint with evidence of erosive destructive changes noted at the joint, erosion and diffuse sclerosis seen throughout the regional distal clavicle, manubrium and the left first ribs, which were suggestive for a chronic process (figure 1). For completeness, a CT head was also performed which was unremarkable.

CrossMark

To cite: Carr F. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-201665

Figure 1 CT of the chest showing complete destruction of the articular surfaces of the left sternoclavicular joint. The CT scan showing evidence of regional osteophyte formation, new bone formation, numerous subarticular erosions and regional sclerosis involving the left manubrium, left distal clavicle and left anterior rib.

Although these changes were suspicious for SAPHO, a bone scan was performed to identify if this was a solitary finding. The bone scan confirmed localised involvement of the anterior chest wall, revealing evidence of avid uptake within the medial left clavicle, the left SCJ and at the level of the sternal angle (figure 2). The combined results from the bone scan and chest CT were highly characteristic for the SAPHO syndrome.

Following a discussion with the radiologist it was felt that a probable diagnosis of the SAPHO syndrome could be made based on the results detected from the diagnostic imaging and her clinical features. Owing to her current clinical situation and her asymptomatic status, the decision was made not to pursue confirmation with bone biopsy as the results would be unlikely to change clinical management.

DIFFERENTIAL DIAGNOSIS

Multiple myeloma, extramedullary plasmacytoma, osteosarcoma, Ewings sarcoma, bone metastasis, chronic or acute

infectious osteomyelitis, Paget's disease, spondylarthropathies and osteitis condensans of the clavicle.

TREATMENT

Since the patient was asymptomatic from her SAPHO presentation then no specific treatment was initiated and she was managed conservatively with observation.

OUTCOME AND FOLLOW-UP

The decision was made not to pursue further investigations nor obtain a tissue diagnosis due to the presence of (fairly) classical clinical presentation, imaging findings and her asymptomatic status, as it would be unlikely to change clinical management. She was managed conservatively with observation only.

Her hospitalisation was briefly complicated by the development of an eczematous rash on her inner forearms, which resolved quickly with topical steroid treatment.

DISCUSSION

The terminology 'SAPHO syndrome' refers to a spectrum of conditions which are usually heterogeneous in presentation. Despite this heterogeneity, two distinct entities have been described for the clinical presentation of SAPHO according to the predominant manifestation.¹ Pustulopsoriatic hyperostatic spondylarthrititis (PPHS), as suggested by the name, is characterised by the presence of certain characteristic dermatological findings which are usually associated with osteoarticular involvement of the SCJ. PPHS is most commonly seen in young adults. The second entity is chronic recurrent multifocal osteomyelitis (CRMO) which describes osteoarticular involvement of the anterior chest wall with or without other axial involvement. CRMO is more commonly observed in children and adolescents but can develop, although less frequently, in adults.

Figure 2 Nuclear bone scan showing isolated avid uptake in the area of the left medial clavicle, the left sternoclavicular joint and at the sternal angle.

Current prevalence rates are difficult to establish due to significant heterogeneity in the presentation and diagnosis. However, the incidence of CRMO has been estimated to be 0.04%.¹ Overall, over half of patients presenting with features of the SAPHO syndrome will present with CRMO. CRMO is more common in children and adolescents in contrast to the older age of presentation for PPHS. Although PPHS is rare in older adults there are several descriptions of established disease in women in the sixth and seventh decades.

Although no specific gender differences have been established it is thought that CRMO is more common in females compared with the male predominance for PPHS.

While the specific aetiological cause for the SAPHO syndrome is unclear, it is thought to most likely be multifactorial in origin, with potential genetic, infectious and immunological components. Infection with *Propionibacterium acnes* has been proposed as a possible trigger, however, more research is required.²

Although SAPHO most commonly presents as either PPHS or CRMO the heterogeneity in presentation is diverse, and can present with non-specific symptoms. Two case reports have described an initial presentation with back pain, which prompted further investigations and led to an eventual diagnosis of the SAPHO syndrome.³ Even with its diverse symptomatology there are usually significant osteoarticular and/or dermatological manifestations present. While these can present simultaneously, more commonly they present in staggered pattern with the osteoarticular features usually presenting significantly earlier. Osteoarticular involvement usually involves the anterior chest wall, in particular, the SCJ. Axial involvement can occur in one-third of patients, and may be segmental (affecting single vertebrae) or, less frequently, involves the sacroiliac joints bilaterally. When there is considerable sacroiliac involvement, differentiating the SAPHO syndrome from ankylosing spondylitis can be very challenging. Involvement of the temporal-mandibular joint has also been described.⁴

PPHS is more commonly associated with inflammation of connective tissue. Although it usually presents with unilateral SCJ involvement, this will almost always be accompanied by certain characteristic skin findings. These characteristic 'classically' described dermatological manifestations include acne, psoriasis, pustular psoriasis, palmoplantar pustulosis, conglobata, fulminans, follicular occlusion triad and hidradenitis suppurates, all of which form a part of the current diagnostic criteria.

The clinical examination may be normal or may reveal only a palpable tenderness over the SCJ on the anterior chest wall. In patients with axial involvement, there may be evidence of bilateral sacroiliitis on palpation over the represented areas and, less frequently, evidence of a peripheral arthritis. In addition, one or more of the previously described dermatological findings will usually be present.

Although the SAPHO syndrome usually presents with one of the above clinical entities, it has also been diagnosed in patients presenting with unrelated systematic conditions. The most commonly described disease association has been with inflammatory bowel disease; however, no established association or link has yet been established between this and the development of the SAPHO syndrome.¹ No current literature exists, to the best of our knowledge, describing an association of the SAPHO syndrome with the development of cognitive impairment, thus highlighting the uniqueness of this case presentation.

Laboratory investigations are usually unremarkable except for the presence of a low-grade inflammatory response, in the form a slightly elevated ESR and/or CRP without evidence of any leukocytosis. The diagnostic radiological imaging classically shows

evidence of osteodestruction (ie, erosions) and osteoproliferation (ie, ossification). Evidence of hyperostosis is a classical finding, which strongly supports a SAPHO diagnosis. Obtaining a ⁹⁹Tc scintigraphy bone scan plays an important role in confirming the diagnosis, especially in the presence of the finding of a 'bull's head sign'³ (characterised by increased tracer uptake in the sternocostoclavicular region with the clinically involved and silent regions showing increased uptake). In addition, it can also provide additional information regarding the disease localisation and activity.

Although not required for diagnosis, additional imaging can include MRI which typically reveals evidence of a sterile bone marrow inflammation. Although histological examination from a bone marrow biopsy can be useful in aiding the diagnosis by showing evidence of a sterile inflammation with infiltration by inflammatory cells, it is not essential for making a diagnosis in the presence of a classical clinical and diagnostic presentation.

Proposed criteria for making a diagnosis of SAPHO requires the presence of one of the following three criteria¹: (1) evidence of multifocal osteitis with or without skin manifestations, (2) sterile acute or chronic joint inflammation associated with either pustules or psoriasis of palms or soles, or acne or hidradenitis and (3) sterile osteitis in the presence of one of the following skin manifestations (psoriasis (pustular or palmo-planter pustulosis) and acne (acne conglobata, acne fulminans or follicular occlusion triad)).

Since there is little evidence available regarding the most appropriate treatment for this condition, management is patient tailored according to the clinical presentation and disease severity. The pharmacological therapy usually involves the use of adequate analgesia with non-steroid anti-inflammatories. Additional treatment options have included the use of corticosteroids, bisphosphonates, azathioprine and biological treatments for more severe cases with varying degrees of success. However, the lack of established benefits combined with an absence of standardised treatment protocols results in the treatment focus being towards symptomatic treatment only.

The SAPHO syndrome is an infrequent condition that, although described in the literature, was a new finding for our team. Previous documentation regarding this condition has involved symptomatic patients presenting with a variety of clinical features which usually involve skin or osteoarticular manifestations, or in accompaniment with systemic conditions with the most common being inflammatory bowel disease. What is unique about this presentation is its asymptomatic manifestation detected as an incidental finding and the age of the patient at presentation, supporting the importance and educational value of this presentation as a case report.

Learning points

- ▶ Synovitis Acne Pustulosis Hyperostosis Osteitis (SAPHO) is an unusual condition that, although most commonly presenting with a diverse range of manifestations, can present as an incidental finding detected during the investigations of other non-related medical conditions.
- ▶ At present, there is no good consensus regarding the most appropriate treatment for this condition and so for patients with an asymptomatic presentation (like the woman in this case), the best option may involve no treatment.
- ▶ The presentation of SAPHO can be very atypical, thus highlighting the importance of keeping a broad differential for any patient presenting with either axial symptoms or typical skin features.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Schilling F. SAPHO syndrome. Orphanet; Jan 2003 (updated Oct 2004). <https://www.orpha.net/data/patho/GB/uk-sapho.pdf>
- 2 Govoni M, Colina M, Massara A, *et al.* SAPHO syndrome and infections. *Autoimmun Rev* 2009;8:256–9.
- 3 Kundu BJ, Naik AK, Bhargava S, *et al.* Diagnosing the SAPHO syndrome: a report of three cases and review of literature. *Clin Rheumatol* 2013;32:1237–43.
- 4 McPhillips A, Wolford LM, Rodrigues DB. SAPHO syndrome with TMJ involvement: review of the literature and case presentation. *Int J Oral Maxillo Surg* 2010;39:1160–7.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow