

# The coexistence of SAPHO syndrome and rheumatoid arthritis

## A case report

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### Abstract

**Rational:** SAPHO (Synovitis-Acne-Pustulosis-Hyperstosis-Osteitis) syndrome is a rare disease featured by its dermatological and osteoarthritic disorders, the latter of which mainly affecting the anterior chest wall, spine, and sacroiliac joint. However, rheumatoid arthritis (RA) is a chronic autoimmune disease, mainly affecting the synovial tissue of small joints in hands and feet. Here, we present an extremely rare case diagnosed with both SAPHO syndrome and RA, with an onset interval of 10 years. So far, only 1 similar case has been reported in the English literature.

**Patient Concerns:** In Sep 2015, a 59-year-old female patient presented to our hospital, complaining of refractory low back pain, left sternoclavicular joint pain, and palmoplantar pustulosis (PPP). In addition, RA had been diagnosed 10 years earlier in the patient, manifested as pain and swelling in bilateral hands and wrists, accompanied by morning stiffness, as well as positive serologic tests.

**Interventions:** In our hospital, laboratory tests revealed elevated inflammatory markers, and imaging examinations of relevant sites showed specific osteoarthritic lesions for SAPHO syndrome.

**Diagnoses:** These findings lead us to make an easy diagnosis of the coexistence of SAPHO syndrome and RA in this patient.

**Outcomes:** Treatment with tripterygium wilfordii polyglycosidum and prednisone was introduced. Both dermatological and osteoarthritic symptoms improved during a 3-month follow-up. Symptoms of RA were successfully controlled with prednisone and leflunomide since 2005.

**Lessons:** We present an extremely rare case diagnosed with both SAPHO syndrome and RA, with an onset interval of 10 years. With this case report, we want to draw attention to the diverse features of SAPHO syndrome.

**Abbreviations:** ACW = anterior chest wall, anti-CCP = anti-cyclic citrullinated peptide, AS = ankylosing spondyloarthritis, MCP = metacarpophalangeal, PIP = proximal interphalangeal, PPP = palmoplantar pustulosis, RA = rheumatoid arthritis, RF = rheumatoid factor, SAPHO = Synovitis-Acne-Pustulosis-Hyperstosis-Osteitis, TWP = tripterygium wilfordii polyglycosidum.

**Keywords:** case report, coexistence, rheumatoid arthritis, SAPHO syndrome

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## 1. Introduction

SAPHO (Synovitis-Acne-Pustulosis-Hyperstosis-Osteitis) syndrome is a rare disease featured by its dermatological and osteoarthritic disorders.<sup>[1]</sup> The osteoarthritic disorders mainly affect the anterior chest wall (ACW, including sternoclavicular, manubriosternal, and costosternal joints), the spine and sacroiliac joint.<sup>[2]</sup> However, the appendicular skeleton, especially the small joint is a less frequently affected site in SAPHO.<sup>[1,2]</sup> However, rheumatoid arthritis (RA) is a chronic inflammatory disease mainly affecting the synovial tissue in joint, which can result in joint damage.<sup>[3]</sup> It is seropositive for rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibody, with a predilection on small joints of the hand and wrist.<sup>[4]</sup>

Here, we present an extremely rare case with both SAPHO syndrome and RA. In our patient, clinical features for SAPHO syndrome appeared in about 10 years after the definite diagnosis of RA. This is a rare and exceptional condition. So far, only 1 similar case has been reported in the English literature.<sup>[5]</sup> With this case report, we want to draw attention to diverse features of SAPHO syndrome.

## 2. Case report

A 59-year-old female patient presented with pain in proximal interphalangeal (PIP) joints and wrist joints of bilateral hands accompanied by morning stiffness since March 2005 and was

**Table 1**  
**The results of laboratory tests and treatments in our patient.**

	Local hospital					Our hospital	
	2005-03	2005-09	2005-11	2015-04	2015-06	2015-09	2015-12
RF	+	N/A	N/A	N/A	N/A	+	N/A
Anti-CCP, AU/mL	437	N/A	N/A	N/A	N/A	302	N/A
ESR, mm/h	N/A	N/A	N/A	50	N/A	22	16
CRP, mg/L	N/A	N/A	N/A	18.5	N/A	2.35	4.13
Treatment for RA	Prednisone (20 mg qd)			Prednisone (10 mg qd) and leflunomide (10 mg qd)			
Treatment for SAPHO				Prednisone (15 mg qd)		TWP (0.6g tid) and prednisone (15 mg qd)	

anti-CCP = anti-cyclic citrullinated peptide antibody, CRP = C-reactive protein, normal range: 0–3 mg/L, ESR = erythrocyte sedimentation rate, normal range: 0–20 mm Hg/h, N/A = not available or not tested, RA = rheumatoid arthritis, RF = rheumatoid factor, SAPHO = Synovitis-Acne-Pustulosis-Hyperostosis-Osteitis, TWP = tripterygium wilfordii polyglycosidum.

diagnosed as RA based on RF positivity and anti-CCP antibody of 437AU/mL at local hospital. The results of laboratory tests were shown in Table 1. Oral corticosteroid (prednisone, 20 mg qd) was prescribed, and symptoms were effectively alleviated. 2 months later, the patient’s symptoms remained stable, and maintenance doses of prednisone (10 mg qd) and leflunomide (10 mg qd) were introduced for RA. Symptoms of RA were successfully controlled with prednisone and leflunomide ever since.

In April 2015, she was presented to local hospital complaining of low back pain, left sternoclavicular joint pain, and PPP in succession within 1 month. X-rays showed degenerative changes of the lumbar spine. CT showed focal cortical erosion with slight sclerosis of left sternoclavicular joint. The results of laboratory tests showed elevated inflammatory markers, and details were shown in Table 1. A diagnosis of SAPHO syndrome was made. Oral corticosteroid therapy (prednisone 15 mg qd) was introduced for 2 months. However, after slight remission, relapse occurred in both dermatological and osteoarthritic symptoms.

In Sep 2015, the patient presented to our hospital, complaining of refractory low back pain, left sternoclavicular joint pain, and

PPP. PPP was observed on physical examination (Fig. 1A–B). Laboratory tests showed elevated ESR of 22 mm/h: seropositive RF and anti-CCP antibody of 302 AU/mL (Table 1). Bone scintigraphy, CT and MRI of the whole spine, as well as MRI of the right hand were performed. Characteristic “bull’s head sign,” which was caused by the tracer uptake in bilateral sternoclavicular joints, bilateral costosternal joints, and manubriosternal joint, was observed on bony scintigraphy (Fig. 1C). CT and MRI of the whole spine demonstrated multiple vertebral corner lesions in lumbar spine (Fig. 2A–F). MRI of the right hand revealed thickened synovial membrane of PIP and metacarpophalangeal (MCP) joints, as well as joint effusion (Fig. 2G–H). The remainder of imaging examinations was normal. A diagnosis of SAPHO syndrome in association with RA was made. Treatment with tripterygium wilfordii polyglycosidum (TWP, 0.6 g tid) in combination with persistent prednisone (15 mg qd) was introduced. Both dermatological and osteoarthritic symptoms improved.

During a 3-month follow-up, the relapse of SAPHO syndrome was triggered by unauthorized discontinuation of prednisone. After returning to the previously prescribed medicine, the patient got partial remission again.

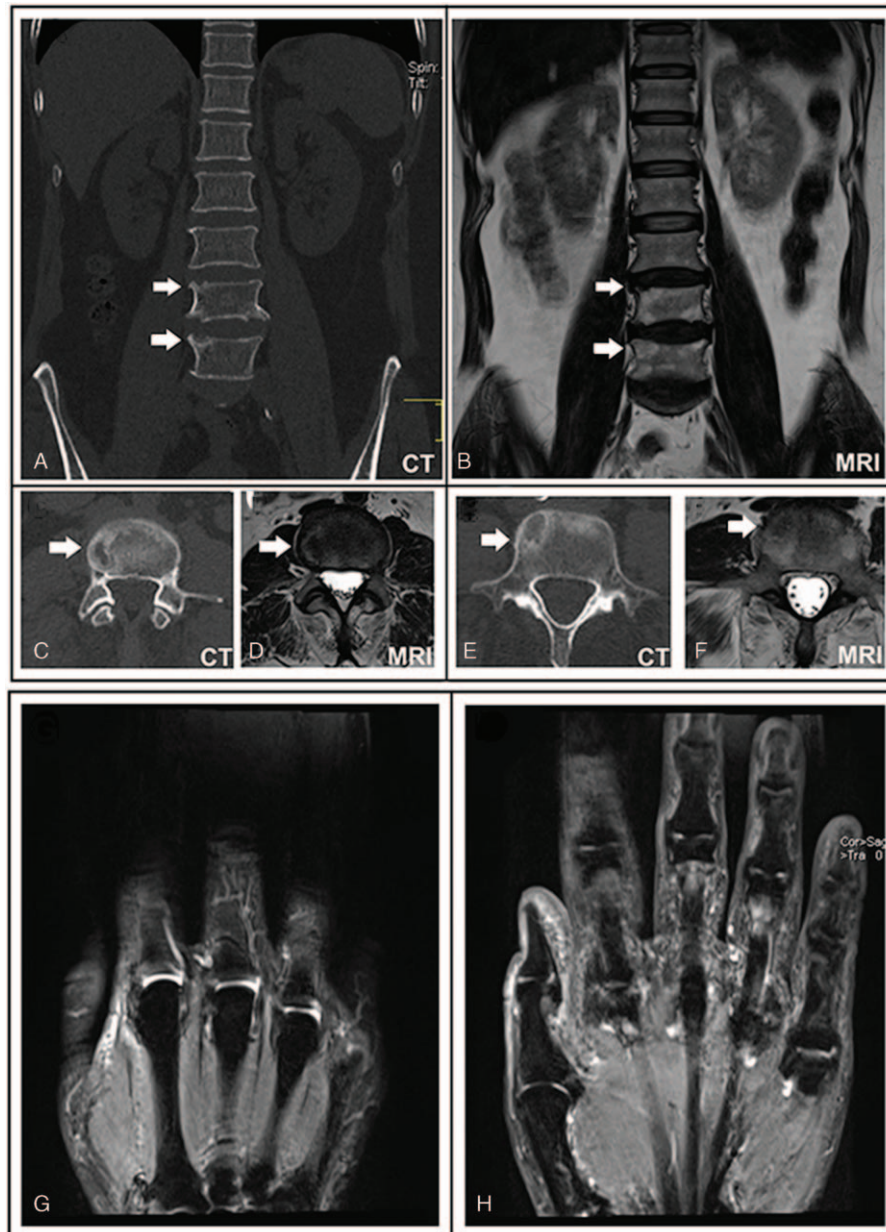
**3. Discussion**

SAPHO syndrome is a unifying concept of a group of dermatological and osteoarthritic disorders.<sup>[6]</sup> The pathogenesis of SAPHO syndrome involves infectious, immunologic, and genetic factors.<sup>[6]</sup> More recently, some researchers have suggested that SAPHO syndrome should be classified within the spectrum of auto-inflammatory bone diseases.<sup>[7]</sup> The natural history of SAPHO usually shows a relapsing-remitting course, with relatively good prognostics. Currently, the most widely used diagnostic criteria for SAPHO is the one proposed by Kahn and Khan in 1994,<sup>[8]</sup> for which the including criteria are as follows: (1) osteoarthritic involvement associated with palmoplantar pustulosis (PPP) and psoriasis vulgaris; (2) osteoarthritic involvement associated with severe acne; (3) isolated sterile hyperostosis/osteitis (adults); (4) chronic recurrent multifocal osteomyelitis (children); and (5) osteoarthritic involvement associated with chronic bowel diseases.

On admission to our hospital, the patient’s characteristic PPP and “bull’s head sign” on bony scintigraphy lead to an easy diagnosis of SAPHO syndrome.<sup>[8]</sup> With regard to the low back pain, imaging examinations demonstrated multiple vertebral corner lesions. Unfortunately, the imaging manifestations of the lumbar spine were not specific for SAPHO and could also be explained by the degenerative changes.<sup>[9,10]</sup> Hence, we could not



**Figure 1.** Pustules on the palms and soles suggestive of palmoplantar pustulosis (PPP) were shown (A,B). The “bull’s head sign” was demonstrated on <sup>99m</sup>Tc-MDP bony scintigraphy (C). PPP = palmoplantar pustulosis.



**Figure 2.** (A–F) Coronal CT (A) and MRI (B) of the lumbar spine showed multiple asymmetrically distributed vertebral corner lesions (arrows). Corresponding axial CT (C, E) and MR (D, F) images demonstrated that the vertebral lesions mainly involved the vertebral corners, manifesting as cortical erosions and slight osteosclerosis as well as abnormal signal intensities in surrounding cancellous bone (arrows). (G, H) Coronal MRI of the right hand revealed thickened synovial membranes of proximal interphalangeal (PIP) and metacarpophalangeal (MCP) joints, as well as joint effusion. CT = computed tomography, MCP = metacarpophalangeal, MRI = magnetic resonance imaging, PIP = proximal interphalangeal.

determine whether our patient was with spinal involvement in SAPHO syndrome or not. For the ACW and spinal involvement in our patient, ankylosing spondyloarthritis (AS) should also be taken into consideration for differential diagnosis.<sup>[11]</sup> However, neither clinical symptoms nor imaging features supported this diagnosis.<sup>[12,13]</sup> Unfortunately, the HLA-B27 antigen was not tested for further confirmation.

However, RA is a chronic autoimmune disease, which is characterized by inflammation and deterioration of the synovial joints.<sup>[4]</sup> It can produce a loss of functionality and reduce quality of life.<sup>[3]</sup> The seropositive RF and high-level anti-CCP antibody, as well as symptoms and MRI of right hand in our patient, which rarely occurred in SAPHO syndrome, were also highly suggestive

of RA, according to the 2010 ACR/EULAR diagnostic criteria for RA.<sup>[4]</sup> Therefore, a diagnosis of SAPHO syndrome in association with RA was made.

A limited number of publications reported the prevalence of RF and anti-CCP antibody, which were significant predictors of RA, in patients with SAPHO syndrome. However, 1.2% of the patients were RF positive in our SAPHO cohort with 164 patients.<sup>[1]</sup> In another study, anti-CCP antibody was negative in all the 69 patients tested.<sup>[14,15]</sup> Only 1 similar case who concurrently fulfilled the diagnostic criteria for both RA and SAPHO syndrome was previously reported.<sup>[5]</sup> However, differently, our patient presented with SAPHO syndrome and RA with an onset interval of 10 years.

In conclusion, we reported a rare case of SAPHO syndrome in association with RA with a 10-year onset interval. SAPHO is a syndrome with diverse features, and we are expecting to see additional special cases.

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