The use of JAK-1 selective inhibitor filgotinib to manage a rare case of concurrent cervical spine calcinosis and inflammatory changes of the odontoid process in diffuse cutaneous systemic sclerosis

Sirs,

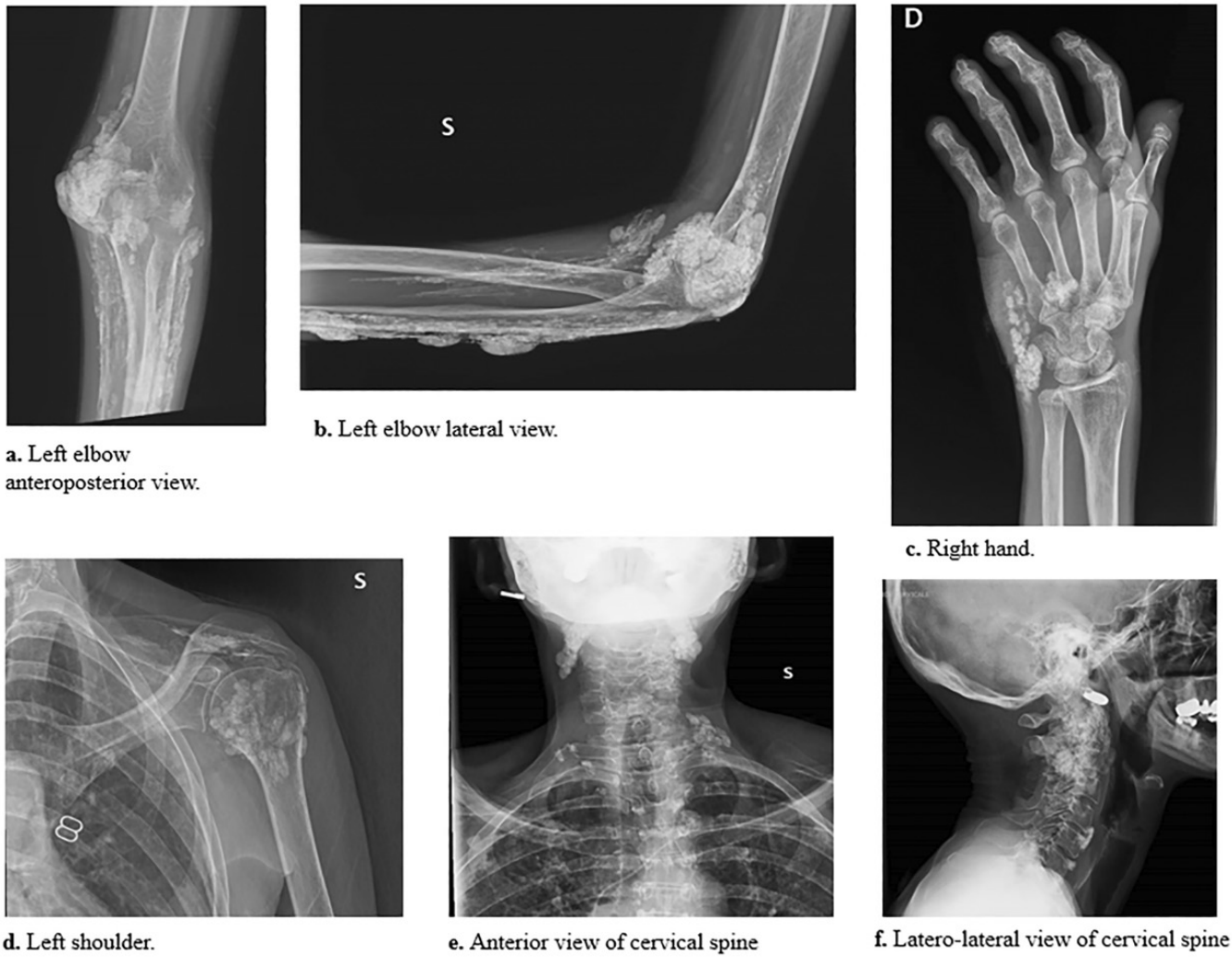
Calcinosis affects approximately 29.4% of patients with systemic sclerosis (SSc), with 13.5% experiencing a substantial disease burden characterised by debilitating complications, functional impairment, and reduced health-related quality of life (1). Although calcinosis typically involves the distal upper extremities, atypical locations such as the cervical spine may also be affected (2). However, the simultaneous occurrence of calcinosis and inflammatory erosive changes of the odontoid process remain unreported in literature.

We describe the case of a 57-year-old woman diagnosed with diffuse SSc in 2008 at the age of forty-one. The patient subsequently received intravenous prostanoids, mycophenolate mofetil, cyclophosphamide and rituximab to address vascular, skin and lung manifestations. By 2016, a progressive and widespread appearance of calcinosis was noted in multiple sites (Fig. 1).

In May 2024, the patient experienced a new onset occipital headache accompanied by cervical stiffness, and a sensation of instability, exacerbated in the upright position. A first computed tomography of the head and neck documented multiple symmetrical peri-odontoid sheet-like calcifications encircling the lateral masses of C2, with bilateral atlanto-axial and epidural extension within the spinal canal. These findings also determined erosive remodelling of the opposing atlanto-axial lateral articular surfaces (Fig. 2*)*. A subsequent magnetic resonance imaging (MRI) confirmed the subchondral reactive oedema at the level of C2 in Short-Tau recovery (STIR) sequencies (Fig. 3 left). These radiological and clinical findings prompt rapid therapeutic intervention and filgotinib, a selective Janus kinase-1 (JAK-1) inhibitor, was initiated at the full dosage of 200 mg daily. After two months, a shift to 100 mg daily was necessary due to concomitant lower bowel infection.

At months three, six and nine, significant reduction was noted in pain VAS scores (95>80>65>55) and inflammatory markers [C-reactive protein (1.67> 1.22> 0.63> 0.60 mg/dl) and erythrocyte sedimentation rate (112> 64> 60> 62 mm/h)]. At month nine, the resorption of the vertebral oedema of the odontoid process was documented in STIR sequences (Fig. 2 right*)*.

Despite increasing efforts in detecting early organ involvement (1, 3, 4), this case highlights the complexity in managing the multifaceted nature of SSc in its advanced stages (1, 2, 5). The current therapeutic landscape for calcinosis cutis is largely informed by anecdotal experience and lacks robust scientific validation (1, 5). In our case, the development of spinal cord compression secondary to cervical spine calci-



a. Left elbow anteroposterior view.

b. Left elbow lateral view.

c. Right hand.

d. Left shoulder.

e. Anterior view of cervical spine

f. Latero-lateral view of cervical spine

Fig. 1. Planned radiographs at various bone sites documenting widespread calcinosis.

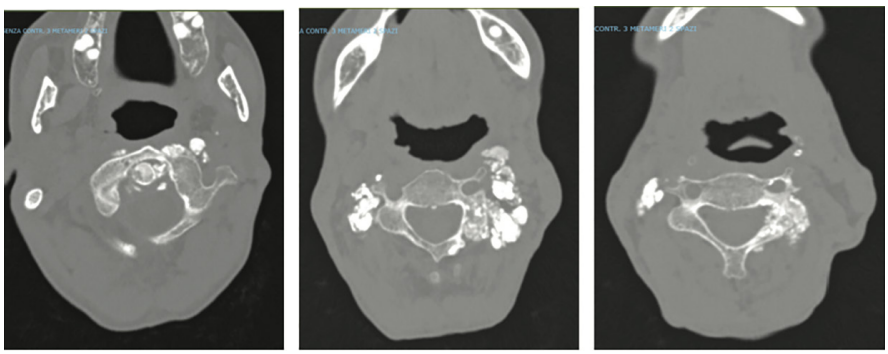


Fig. 2. Cervical coronal CT scans.

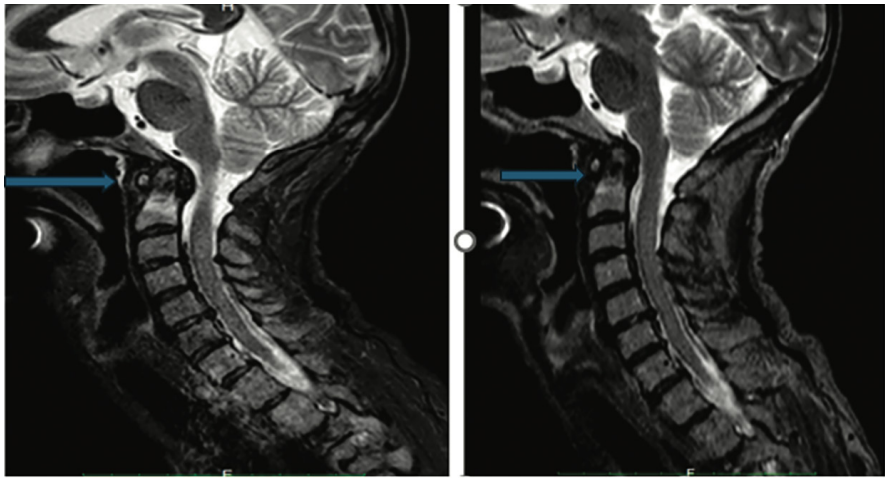


Fig. 3. Cervical spine MRI short-Tau recovery sequences before (left) and after 9 months (right) of filgotinib therapy, with arrows showing oedema and erosive process of C2 progressive reduction.

nosis highlighted the ineffectiveness of previously administered immunosuppressive therapies in halting disease progression. In this context, JAK1 selective inhibitor filgotinib was started based on the observation of the role of the JAK-STAT pathways in SSc pathogenesis (1, 4, 6). Moriana *et al*. reported tofacitinib and baricitinib effectiveness in managing skin fibrosis and interstitial lung disease in 59 SSc patients (7). Tofacitinib has also shown promise in three cases of calcinosis associated with dermatomyositis (8). Additionally, the TORTUGA trial evaluated the effectiveness of filgotinib on inflammatory and structural changes at various spinal locations in patients with active ankylosing spondylitis (AS) (9).

Lastly, surgical excision is currently the only effective approach for calcinotic lesions causing spinal stenosis. Smucker *et al*. examined three cases of surgical intervention for destructive calcific lesions of the cervical spine in SSc patients, recording symptom alleviation, however, the authors emphasised on the complexity and riskiness of these procedures (10).

To our knowledge, this is the first case showing the effectiveness of filgotinib in declining pain scores, inflammatory markers and reducing bone oedema extension in simultaneous cervical spine calcinosis and oedematous erosive lesions at C2 level. Moreover, the dose adjustability of filgotinib avoided the useless discontinuation due to concurrent adverse event. Further studies are warranted to explore the broader application of filgotinib and similar agents in systemic sclerosis-related calcinosis and other inflammatory condition.

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