Case Report

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Radiology Section

A Case of Lupus Erythematosus Panniculitis of the Abdominal Wall: Imaging-cytopathological Association

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ABSTRACT

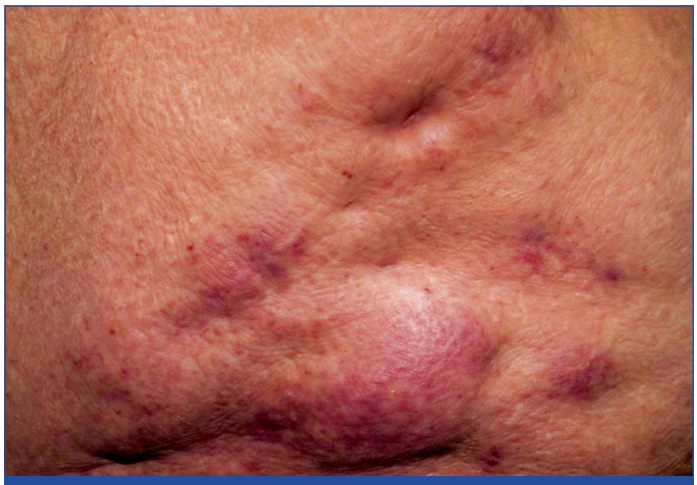
Lupus Erythematosus Panniculitis (LEP), is an uncommon inflammatory manifestation of Systemic Lupus Erythematosus (SLE) characterised by immune-mediated inflammation of the subcutaneous adipose tissue. Abdominal wall involvement is uncommon and may mimic other inflammatory or neoplastic conditions, creating diagnostic difficulty. A 43-year-old female with long-standing SLE complicated by lupus nephritis presented with acute diffuse abdominal wall pain. Physical examination revealed ill-defined subcutaneous nodules with erythema and indurations. Ultrasound demonstrated heterogeneous subcutaneous tissue with poorly defined hypoechoic nodular foci. Ultrasound-guided Fine-Needle Aspiration Cytology (FNAC) showed lymphocytic panniculitis and degeneration of adipocytes and foamy macrophages. Non contrast Computed Tomography (CT) of the abdomen showed diffuse nodular stranding of fat within abdominal anterior wall and bilateral flanks with diffuse dystrophic calcifications in subcutaneous tissue. These imaging findings, in conjunction with the clinical and cytological features, were highly suggestive of LEP. The patient responded positively to corticosteroid pulse therapy followed by oral steroids. The present case emphasises diagnostic value of multimodality imaging and invasive cytological sampling in determination of panniculitis in patients with SLE.

Keywords: Adipose tissue disease, Computed tomography, Subcutaneous inflammation, Systemic lupus erythematosus, Ultrasound

CASE REPORT

A 43-year-old female reported to Outpatient Rheumatology with a five-day history of diffuse acute lower abdominal wall pain associated with tender subcutaneous nodules involving the infraumbilical region and bilateral flanks. The pain was insidious in nature, slowly progressive. The patient characterised pain as dull and constant, increasing with exacerbation lying on back, and with movements that involve contraction of abdominal musculature. No trauma history, fever, vomiting, diarrhoea, gastrointestinal bleeding, urinary complaints were observed. The patient had previous diagnosis of SLE confirmed seven years ago according to clinical and serological criteria, including positive antinuclear antibodies and anti-double-stranded Deoxyribonucleic Acid (DNA) antibodies. Her disease course had already been complicated by neuropsychiatric manifestations including recurrent episodes of lupus-related headache and mood disturbances, along with lupus nephritis, which was classified as class III lupus nephritis on prior renal biopsy performed three years earlier according to the International Society of Nephrology/Renal Pathology Society (ISN/RPS) classification [1]. Following the diagnosis of SLE and subsequent development of lupus nephritis, the patient had been maintained on immunosuppressive therapy including mycophenolate mofetil (500 mg 2 times/day), hydroxychloroquine (200 mg/day), low-dose oral prednisolone (10 mg/day). The patient also had a history of intermittent disease flares involving arthritis and mucocutaneous manifestations including oral ulcers and photosensitive skin rashes, which were treated with short courses of corticosteroids.

Physical examination revealed that patient was obese with body mass index of about 32 kg/m^2. Her vital signs were stable, and she did not have fever or haemodynamic instability. Anterior abdominal wall inspection revealed multiple ill-defined subcutaneous nodules with overlying erythematous to violaceous discoloration. The lesions are firm-appearing, variably sized, and coalescent in places, with surrounding skin induration. No obvious ulceration or discharge seen [Table/Fig-1]. Palpation produced diffuse tenderness in anterior abdominal wall, mainly in infra-umbilical region.

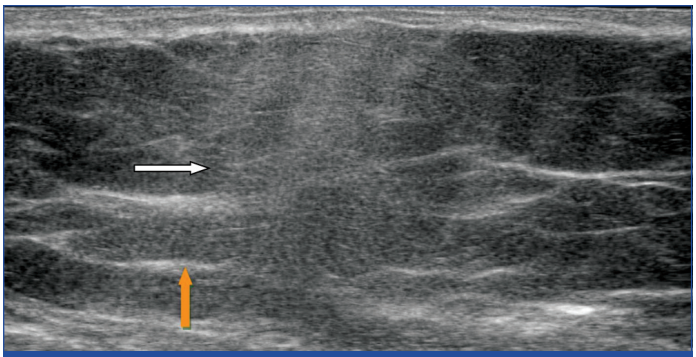


[Table/Fig-1]: Clinical photograph showing multiple ill-defined erythematous subcutaneous nodules over the anterior abdominal wall and bilateral flanks.

Laboratory tests revealed that results were similar to active SLE. Antinuclear Antibody (ANA) testing was positive with a speckled pattern at a titer of 1:320. Erythrocyte sedimentation rate was raised to 85 mm/hour, whereas C-Reactive Protein was 2 mg/L found to be within normal range, complete blood count showed isolated thrombocytopaenia; the platelet count was 85,000/µL, where haemoglobin and leucocyte count were within normal limits. Renal function tests revealed serum creatinine of 1.4 mg/dL with approximated glomerular filtration rate of about 45 mL/min/1.73 m^2, which was similar to stage 3 Chronic Kidney Disease (CKD).

Since abdominal wall pain was persistent, and physical examination revealed subcutaneous nodules, imaging analysis was introduced. High-frequency ultrasound examination of the anterior abdominal wall was performed using a linear transducer. Sonography demonstrated diffuse heterogeneity of the subcutaneous adipose tissue involving the infraumbilical anterior abdominal wall and bilateral flank regions, with increased echogenicity of the fat lobules and thickening of the interlobular fibrous septae. Multiple poorly defined hypoechoic

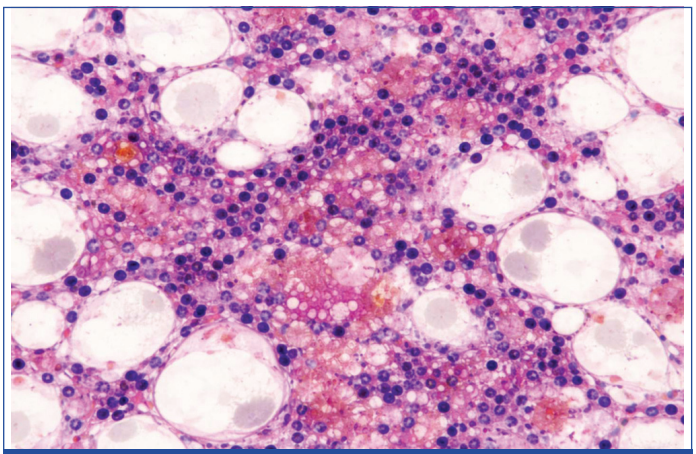
nodular foci measuring approximately 0.8-1.5 cm were identified within the subcutaneous plane. Mild surrounding inflammatory fat echogenicity was noted without evidence of loculated fluid collection, abscess formation, or sinus tract communication [Table/Fig-2]. These findings raised suspicion of inflammatory panniculitis, with differential considerations including LEP, erythema nodosum, and Subcutaneous Panniculitis-Like T-Cell Lymphoma (SPTCL).



[Table/Fig-2]: Ultrasound image showing increased echogenicity of subcutaneous fat (white arrow) with thickened interlobular septae (orange arrow) in the right flank region.

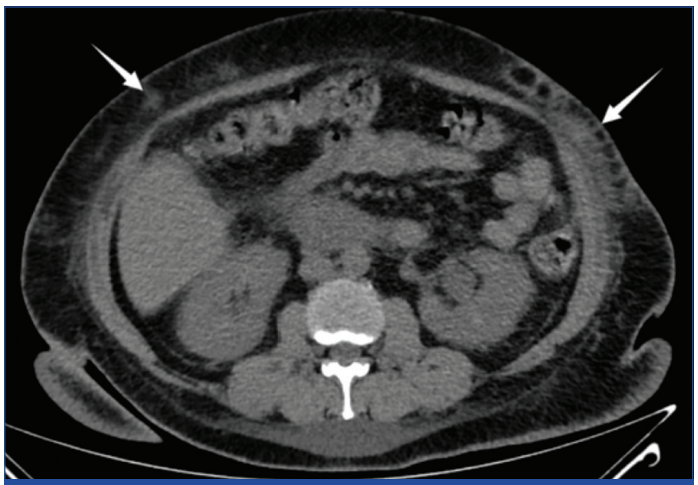
To further characterise the lesion and exclude neoplastic panniculitis, ultrasound-guided FNAC was performed from a representative infra-umbilical subcutaneous nodule. Under aseptic conditions and real-time ultrasound guidance, a 23-gauge needle was introduced into the lesion and multiple aspiration passes were obtained.

Cytological examination {Haematoxylin and Eosin stain (H&E)} demonstrated numerous mature lymphocytes, histiocytes, foamy macrophages, and degenerating adipocytes within an inflammatory background. Focal areas of fat necrosis were also identified without evidence of atypical lymphoid proliferation or malignant cells [Table/Fig-3]. These cytological findings were consistent with inflammatory panniculitis in the appropriate clinical and radiological setting. Although histopathological examination remains the diagnostic gold standard for LEP and for exclusion of SPTCL, core biopsy was deferred in the present case because the patient had thrombocytopaenia (platelet count: 85,000/µL), increasing the procedural bleeding risk. In addition, the patient demonstrated symptomatic improvement following intravenous methylprednisolone pulse therapy (1g/day), was initiated immediately after cytological evaluation and continued for three consecutive days, followed by oral prednisolone therapy starting at 40 mg/day with gradual tapering. The patient also lacked imaging or cytological features strongly suggestive of malignancy.

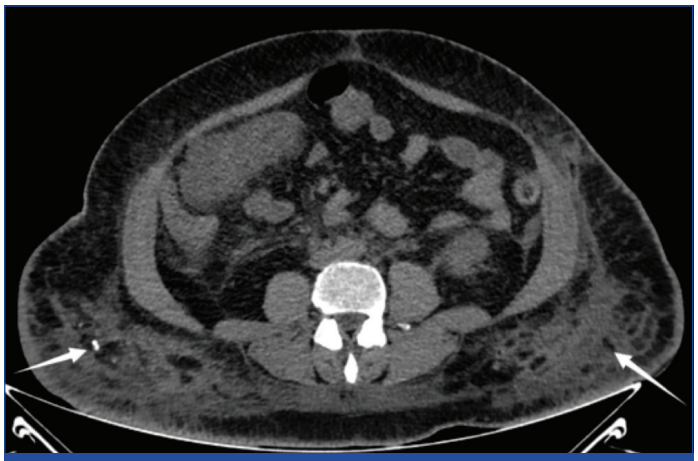


[Table/Fig-3]: Cytological smear showing inflammatory panniculitis with lymphocytes, histiocytes, and fat necrosis (Haematoxylin and eosin stain, ×400).

Further evaluation with non contrast CT of the abdomen was performed. Contrast-enhanced CT was avoided due to the patient's underlying CKD, and Magnetic Resonance Imaging (MRI) was not feasible because of severe claustrophobia. Non contrast CT demonstrated diffuse nodular subcutaneous fat stranding predominantly involving the infraumbilical anterior abdominal wall and bilateral posterolateral flank regions [Table/Fig-4]. Associated irregular septal thickening and multiple punctate to coarse dystrophic calcifications were noted within the involved subcutaneous adipose tissue predominantly in the bilateral flank regions [Table/Fig-5]. No discrete soft-tissue mass, drainable collection, fascial plane extension, or intramuscular involvement was identified. The imaging pattern of nodular panniculitic fat infiltration with dystrophic calcification corresponded with previously reported imaging manifestations of chronic LEP in the literature.

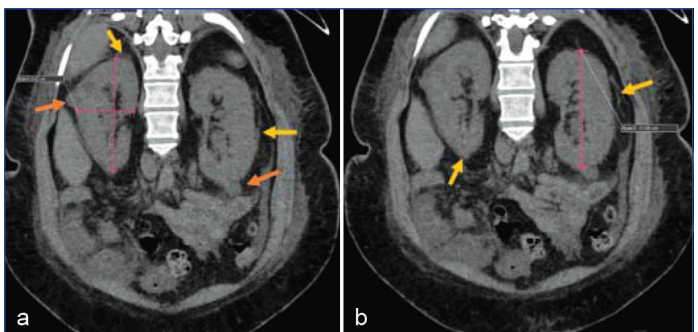


[Table/Fig-4]: Axial non contrast CT image showing nodular subcutaneous panniculitis of both anterolateral abdominal walls (white arrows).



[Table/Fig-5]: Axial non contrast CT image showing nodular subcutaneous panniculitis with dystrophic calcifications in both flanks (white arrows).

Incidental findings on CT were mild hepatomegaly and cholelithiasis. Both kidneys were mildly enlarged measuring approximately 12.8 cm on the right and 13 cm on the left in craniocaudal length with multiple exophytic cortical cysts. Mild bilateral perinephric fat stranding was also observed [Table/Fig-6]. Based on the clinical history of SLE, characteristic imaging findings, and supportive cytological features, a final diagnosis of LEP involving the anterior abdominal wall and bilateral flanks was established.



[Table/Fig-6]: a,b) Coronal non contrast CT image showing bilateral enlarged kidneys with exophytic cortical cysts (Orange arrows) and mild perinephric fat stranding (Yellow arrows).

Within five days of therapy, the patient reported marked improvement in abdominal wall pain and tenderness. She was subsequently discharged with continuation of maintenance immunosuppressive therapy and scheduled follow-up in the rheumatology clinic.

DISCUSSION

The LEP is a significant yet rare manifestation of SLE and sparsely reported. The condition accounts for about 2-5% of all SLE patients, and it extensively develops mostly in women aged in their 4th and 5th decades of their life [2,3]. Most of reported cases of lesions involved face, upper arms, buttocks, or proximal thighs [3-5]. Abdominal wall involvement is particularly rare and can create diagnostic confusion due to symptom mimicry and intra-abdominal pathology [6,7].

The present case was diagnostically challenging for several reasons. First, the patient presented primarily with diffuse lower abdominal pain rather than obvious cutaneous manifestations. In obese individuals, inflammatory nodules involving deeper subcutaneous tissues may be clinically difficult to localise and may initially mimic intra-abdominal, infective, or neoplastic pathology. In the present case, physical examination demonstrated only ill-defined subcutaneous nodularity and tenderness without ulceration, abscess formation, or overt cutaneous lupus lesions.

Second, imaging evaluation was limited by CKD and severe claustrophobia, precluding contrast-enhanced CT and MRI. Despite these limitations, non contrast CT demonstrated characteristic nodular panniculitic fat stranding, septal thickening, and dystrophic calcifications involving the anterior abdominal wall and bilateral flanks. Previous studies have described calcification and chronic fat necrosis as imaging manifestations of long-standing lupus panniculitis [8]. The present case therefore highlights the diagnostic value of non contrast CT in selected patients in whom contrast-enhanced imaging cannot be performed.

The differential diagnosis included erythema nodosum, infective panniculitis, and SPTCL [5-7]. SPTCL represented an important consideration because it may demonstrate overlapping imaging and cytological features with LEP. However, the absence of constitutional symptoms, lack of atypical lymphoid cells on cytology, known background history of SLE, and favorable corticosteroid response supported inflammatory lupus panniculitis in the present case [5,9].

Histopathological examination remains the diagnostic gold standard for LEP and for exclusion of SPTCL. In the present case, biopsy was deferred because of thrombocytopaenia and increased bleeding risk. Ultrasound-guided FNAC was therefore utilised as a less invasive diagnostic adjunct and demonstrated inflammatory panniculitis without overt malignant cytological features. Nevertheless, the absence of histopathological and immunophenotypic confirmation remains an important limitation. Management of LEP primarily involves systemic corticosteroids and immunosuppressive therapy tailored to the severity of underlying SLE and extent of panniculitic involvement. Most patients demonstrate favourable response to corticosteroids, hydroxychloroquine, and steroid-sparing immunosuppressive agents, although recurrent disease flares and residual lipoatrophy may occur in chronic cases [10]. Early diagnosis and treatment are important to reduce inflammation, prevent progressive fat necrosis and calcification, and improve long-term clinical outcomes.

Previous reports of LEP have predominantly described involvement of the face, upper extremities, buttocks, or proximal thighs [3-6]. Zhao YK et al., described trunk involvement evaluated with ultrasound and MRI, whereas Kimball H et al., emphasised multimodality imaging correlation in facial lupus panniculitis [10,11]. Truncal involvement has been infrequently reported, and isolated abdominal wall panniculitis presenting primarily as diffuse abdominal pain remains uncommon in the literature [12,13]. In contrast, the present case demonstrates abdominal wall involvement evaluated primarily using ultrasound and non contrast CT because both contrast-enhanced CT and MRI were not feasible. The present case therefore adds to the limited literature regarding atypical abdominal wall LEP and highlights the diagnostic utility of non contrast CT and ultrasound-guided cytological assessment in resource-limited or clinically constrained settings. Similar cases from the literature are presented in [Table/Fig-7] [2-5,10-13].

Study	Country	Age/Sex	Duration of SLE	Site of involvement	Imaging findings	Diagnostic confirmation	Treatment
Martens PB et al., 1999 [4]	USA	Adult/Female	Not specified	Extremities	Not specifically described	Histopathology	Corticosteroids
Diaz-Cascajo C et al., 2002 [13]	Spain	Adult/Female	Not specified	Trunk	Subcutaneous inflammatory lesions	Biopsy	Immunosuppressive therapy
Arai S et al., 2009 [3]	Japan	Multiple patients	Variable	Multiple sites	Variable imaging manifestations	Histopathology	Variable therapy
Zhao YK et al., 2016 [10]	China	Adult/Female	Present	Trunk	Ultrasound and MRI demonstrating panniculitis	Biopsy	Corticosteroids
Kimball H et al., 2019 [11]	USA	Adult/Female	Present	Face	Ultrasound, CT, and MRI correlation	Histopathology	Corticosteroids
Ali AM et al., 2023 [2]	Turkey	Adult/Female	Present	Face and arms	Ultrasound findings of panniculitis	Biopsy	Steroids
Zsófia K et al., 2023[12]	Hungary	Multiple patients	Variable	Multiple sites	CT and ultrasound findings	Biopsy	Immunosuppressive therapy
Sutedja E et al., 2023 [5]	Indonesia	Adult/Female	Present	Trunk	MRI findings of panniculitis	Biopsy	Corticosteroids
Present case 2026	India	43/Female	7 years	Anterior abdominal wall and bilateral flanks	Ultrasound and non contrast CT demonstrating nodular panniculitis with dystrophic calcifications	Ultrasound-guided FNAC	Pulse corticosteroids and maintenance immunosuppression

[Table/Fig-7]: Previously reported cases of Lupus Erythematosus Panniculitis (LEP) in literature [2-5,10-13].

CONCLUSION(S)

The present case report highlights constraints in diagnosis of LEP among patients with SLE and lupus nephritis. In a patient with contraindications to contrast-enhanced imaging and MRI, non contrast CT was necessary to establish characteristic imaging parameters of LEP. LEP should be identified at early stage and addressed to avoid complications and improve patient outcomes. The case provides relevance to LEP in differentiating diagnosis in different patients of SLE that have atypical symptoms and it indicates relevance of non contrast CT in diagnosis process.

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