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Case Report Open Access

A rare case of axillary web syndrome with anterior chest wall extension in a patient with diffuse large B-cell lymphoma: A case report

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ABSTRACT

Axillary web syndrome (AWS) is an underdiagnosed condition commonly observed after breast cancer surgery involving axillary lymph node dissection. We report the case of a 48-year-old male with diffuse large B-cell lymphoma who developed left shoulder pain and restricted motion six weeks after an excisional axillary lymph node biopsy. Internal rotation revealed striations along the anterior chest wall, whereas abduction and flexion demonstrated palpable cords extending toward the axilla and cubital region. These findings are consistent with atypical AWS following a minor axillary procedure. This case highlights that AWS is not limited to breast cancer or extensive surgical interventions and underscores the importance of clinical awareness in physical medicine and rehabilitation settings.

Keywords: Axillary web syndrome, breast cancer, lymphoma, thrombophlebitis.

Axillary web syndrome (AWS) is a frequently under-recognized clinical condition that typically occurs after breast cancer surgery involving axillary lymph node dissection (ALND). However, it has also been reported following other axillary or shoulder interventions, including trauma, infection, and various lymph node-related surgical procedures.[1]

Axillary web syndrome is characterized by the presence of a palpable, tight, subcutaneous cord in the axilla that may extend along the anteromedial aspect of the arm to the forearm and, in rare cases, to the thumb. Common clinical manifestations include axillary pain radiating down the arm and restricted shoulder mobility, particularly during abduction.[2] Axillary web syndrome usually develops within 2-8 weeks after breast cancer surgery, although delayed presentations occurring months or even years later have been described. The condition may resolve spontaneously, but is also prone to recurrence.[1] The reported incidence of AWS varies widely across studies, ranging from 5.2 to 72% following ALND and from 0.9 to 45% following sentinel lymph node biopsy.[3]

The most widely accepted pathophysiological mechanism involves injury to superficial lymphatic vessels and veins during axillary surgery, leading to thrombosis, inflammation, and subsequent fibrosis. Although AWS is generally self-limiting, management primarily focuses on pain reduction and preservation of shoulder mobility. Conservative treatment, particularly exercise-based rehabilitation and patient education, remains the cornerstone of management. Pharmacological therapy may be used for symptomatic relief, whereas surgical intervention is not recommended.[4]

This case report describes a patient who developed AWS following an excisional lymph node biopsy for lymphoma, with involvement of the anterior chest wall and proximal upper extremity. Although the distribution of the cords could suggest Mondor's disease, a term often misapplied in the literature,[1] the clinical presentation and

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underlying etiology in this case are more consistent with AWS and provide insight into its diagnosis and management.

CASE REPORT

A 48-year-old male patient underwent an excisional axillary lymph node biopsy in August 2024 due to clinical suspicion of lymphoma. He had no significant comorbidities and a body mass index (BMI) of 24.5 kg/m². His family history was notable for maternal diabetes mellitus. Histopathological examination confirmed a diagnosis of diffuse large B-cell lymphoma. The patient subsequently received chemotherapy consisting of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone according to the R-CHOP-21 protocol, which was initiated approximately 10 days after the biopsy. Following the first cycle of chemotherapy—and approximately six weeks after the biopsy—the patient began to experience left upper extremity pain, a sensation of tightness, and restricted shoulder mobility, and he presented to our clinic in October 2024 with these complaints. Physical examination revealed that left shoulder abduction was limited to 150° (normal: 180°), and internal rotation was restricted to 45° (normal: 70°). Other joints' ranges of motion were within normal limits.

During internal rotation of the left shoulder, visible striations were observed along the anterior chest wall over the left pectoral region (Figure 1a). Further examination performed during shoulder abduction and flexion revealed palpable cords extending from the axilla toward the cubital region (Figure 1b). Elbow extension was limited by 15°, whereas flexion remained normal, as shown in Figure 1c. There were no signs of erythema, warmth, or local inflammation.

The patient's initial Visual Analog Scale (VAS) score for pain was 6, and the quick Disabilities of the Arm, Shoulder and Hand (QDASH) score was 27. Stemmer sign and pitting edema were negative in the patient. Circumferential measurements of both upper extremities, calculated using the truncated cone formula, revealed a volume difference of only 1%, effectively ruling out lymphedema.

Ultrasonographic evaluation of the anterior chest wall, arm, and volar forearm surfaces revealed no significant pathological findings (Linear probe 5-12 MHz). In contrast to previous reports, the relatively lower resolution of the transducer used in our study may have limited our ability to visualize the structural features described for axillary web syndrome.[1] The dermal-epidermal junction was clearly visualized, and the hypoechoic subcutaneous

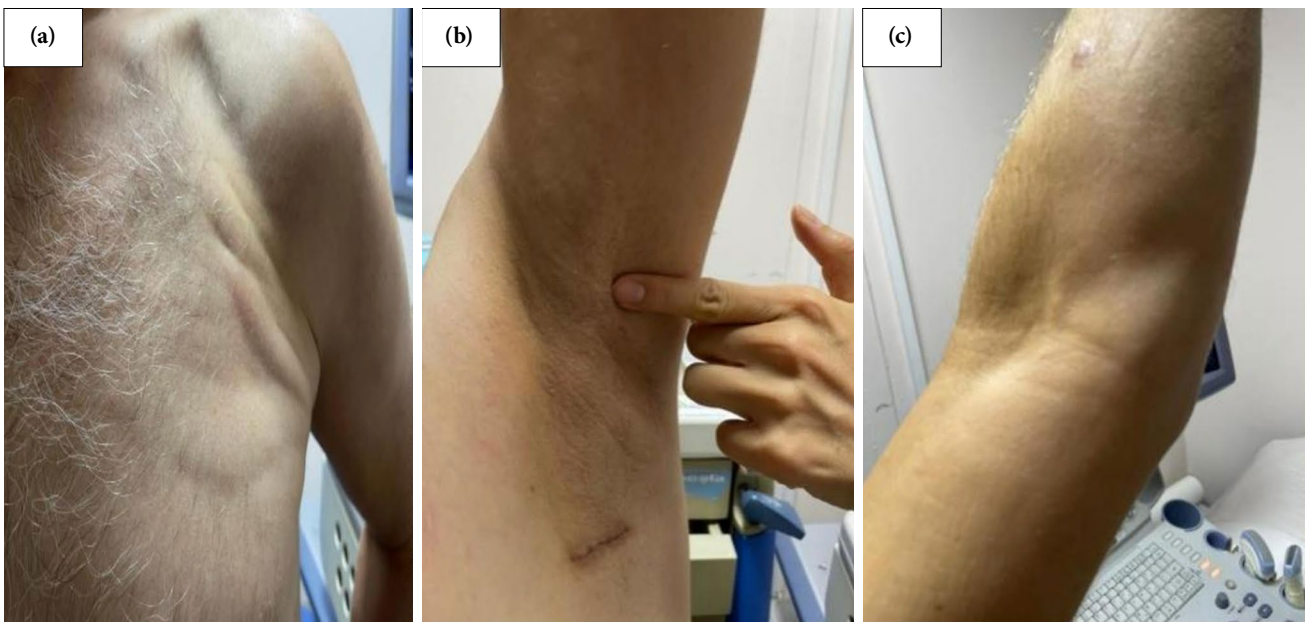

Figure 1. Pre-treatment images demonstrating axillary web syndrome in the left upper extremity. **(a)** Cords radiating to the upper outer quadrant of the breast, with limited shoulder internal rotation. **(b)** Visible and palpable cord-like subcutaneous bands extending from the left axilla, associated with restricted left shoulder abduction. **(c)** Extension of the taut cord structures into the cubital region.

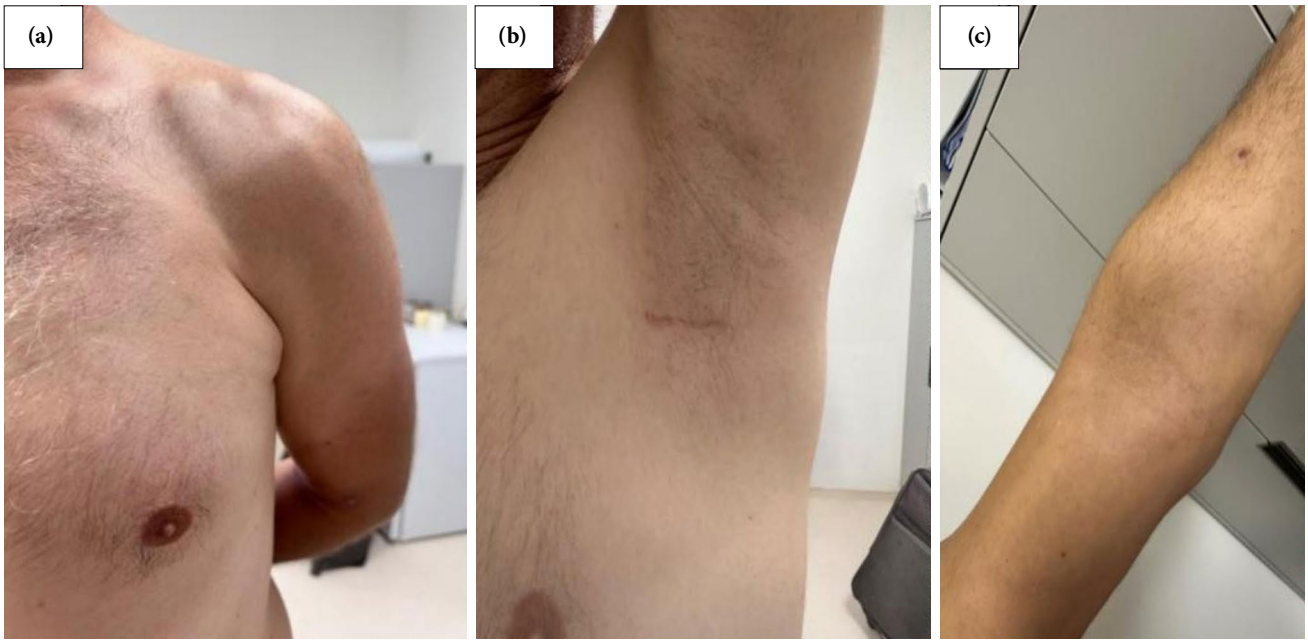

Figure 2. Post-treatment images of the anterior chest wall, axillary region, and cubital area. **(a)** No residual cords along the anterior chest wall, with restoration of shoulder internal rotation. **(b)** Resolution of axillary cord-like structures, with full recovery of shoulder abduction. **(c)** Disappearance of cubital cords, with complete elbow extension.

fat layer appeared normal, separated by hyperechoic septa. Doppler ultrasonography showed no evidence of thrombophlebitis. Laboratory investigations, including complete blood count, erythrocyte sedimentation rate, C-reactive protein, D-dimer levels, coagulation parameters (prothrombin time, activated partial thromboplastin time, and international normalized ratio), and liver and renal function tests, were all within normal limits.

Although the patient was initially referred with a preliminary diagnosis of lymphedema due to prior lymph node dissection, clinical findings supported a final diagnosis of AWS.

The patient was enrolled in a structured physiotherapy program. Nonsteroidal anti-inflammatory drugs were prescribed for pain management. The rehabilitation program included pectoralis muscle stretching, shoulder abduction and flexion exercises, and specific cord stretching and mobilization techniques. The patient was instructed to perform two sets of 7 to 10 repetitions daily for four weeks.

At the four-week follow-up, the pectoral cords had become less prominent, and improvements were noted in shoulder abduction and elbow extension. The cords were no longer palpable in the axillary and cubital regions. The VAS score decreased to 3, and the QDASH score improved to 18. Three months after the initial presentation, the cords had completely resolved, with a VAS score of 0 and a QDASH score of 0 points, as shown in Figure 2a-c. Written informed consent was obtained from the patient for publication of this case.

DISCUSSION

Axillary web syndrome is characterized by the development of a fibrotic, cord-like structure within the subcutaneous tissue of the axillary region. Clinically, AWS presents as a tense, palpable, and sometimes visible web of tissue that restricts shoulder mobility and is frequently associated with pain. The condition most commonly emerges within the first 2-8 weeks following surgery.[1,5,6] Several risk factors have been associated with AWS, including ALND, younger age, lower BMI, and the use of adjuvant radiotherapy or chemotherapy. Hypertension has also been identified as a potential risk factor, whereas diabetes mellitus has been suggested to exert a protective effect.[8-11] Axillary web syndrome is more frequently reported following axillary procedures related to breast cancer surgery. However, although it is typically associated with major surgical

interventions, AWS can rarely develop after minor axillary procedures.

A review of the literature indicates that only a limited number of AWS cases have been reported following ALND for conditions such as melanoma and mycosis fungoides. One previously published case described bilateral AWS in a patient with non-Hodgkin lymphoma who had no history of axillary surgery; in that instance, AWS developed after chemotherapy, suggesting a potential contributory role of chemotherapeutic agents in its pathogenesis.[5] In the present case, cord formation became evident six weeks after a diagnostic axillary intervention and resulted in painful restriction of shoulder motion. Similar to previously reported cases, our patient shared several potential risk factors, including relatively young age, normal BMI, and exposure to chemotherapy. Notably, this case underscores the rare occurrence of AWS following a minimally invasive diagnostic axillary procedure.

Chest wall cording in AWS may present a diagnostic challenge because it can resemble Mondor's disease, as both conditions may manifest as cord-like lesions along the chest wall. Mondor's disease is defined by superficial thrombophlebitis of the chest wall veins and typically appears as a thicker, vein-like structure, often located along the inferior breast crease after breast surgery.[1] In the present case, the anatomical location of the cord initially raised suspicion for Mondor's disease. However, the absence of erythema, warmth, and other inflammatory signs, together with Doppler ultrasonography findings that excluded superficial venous thrombosis, supported the diagnosis of AWS. In a prospective cohort study by Figuera et al.[9] involving 173 patients monitored for AWS after breast surgery, only one patient demonstrated a cord extending to the anterior chest wall. Although AWS typically affects classical anatomical regions, anterior chest wall involvement has been rarely documented, as observed in our patient. This case further highlights the potential for atypical AWS presentations, with cord extension involving the breast, trunk, and upper extremities, thereby mimicking Mondor's disease.

Physical therapy remains the cornerstone of AWS management, with primary goals focused on pain reduction and functional restoration. Standard treatment strategies include patient education, manual therapy, therapeutic exercises, and adjunctive modalities. Manual interventions, such as soft tissue mobilization and myofascial release, have been reported to reduce adhesions, alleviate pain, and improve mobility.[1,5,7] In cases of recurrent or refractory AWS, alternative interventions, including needle aponeurotomy combined with immediate fat grafting, collagenase (Xiaflex®) injections, and steroid injections with needle rigotomy, have been described.[12,13] In the present case, conservative management consisting of stretching exercises, range-of-motion training, cord mobilization, skin traction techniques, and nonsteroidal anti-inflammatory drugs proved sufficient for symptom resolution. These conventional interventions were effective in reducing pain and restoring the functional range of motion.

In conclusion, axillary web syndrome should be considered in patients presenting with shoulder pain and restricted mobility following either minor or major axillary surgical procedures. The extent and anatomical distribution of AWS involvement may vary considerably. This case emphasizes that AWS is not exclusive to patients undergoing breast cancer-related surgery and highlights the importance of maintaining clinical vigilance for this condition during physical practiceand rehabilitation assessments.

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