

# Occurrence of axillary web syndrome without surgical intervention: a case report

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## Abstract

Axillary web syndrome (AWS) is characterized by the formation of cords in the axilla. Classically, it develops after surgical biopsy or removal of axillary lymph nodes for breast cancer. It can cause a limited range of motion and may contribute to abnormal shoulder movements or patterns that can cause pain. In this report, an atypical case of AWS presented in a 38-year-old male after physical activity but with no surgical history or breast cancer. This case report highlights that AWS can appear in healthy individuals with no history of breast cancer and/or surgical intervention. It also emphasizes the need to consider AWS in clinical practice as a differential diagnosis of painful shoulder movement and restricted range of motion.

## Keywords

Limited range of motion, lymphatic cording, physical exertion, painful shoulder movement

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## Introduction

Axillary web syndrome (AWS), which is also called lymphatic cording and axillary variant of Mondor's disease, is characterized by a single cord or multiple cords of tissue that develop in the axilla.<sup>1,2</sup> Cording may extend further from the axilla to the arm and forearm.<sup>1</sup> It usually develops after surgical removal of axillary lymph nodes or sentinel lymph node biopsy in patients with breast cancer. Its incidence and prevalence rate ranges between 5.2% to 36% following dissection of axillary lymph nodes and 0.9% to 25% following

sentinel lymph node biopsy.<sup>1,2</sup> It is accompanied by painful shoulder abduction, directional limitation of motion into shoulder abduction and reduction of the fluidity

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of movement of the upper limb with alteration of joint biomechanics.<sup>3,4</sup> Examination of biopsies taken from cording tissue revealed lymphatic blockage in several studies, while a few studies showed venous blockage.<sup>2</sup> However, the pathophysiology underlying AWS is not fully understood.<sup>2,5</sup> Treatment of AWS with physiotherapy has been shown to produce positive outcomes.<sup>6</sup>

There are very few reports on the occurrence of AWS without surgical intervention. To the best of our knowledge, there are only two reports of idiopathic AWS<sup>7,8</sup> and two other reports of AWS following physical exertion.<sup>9,10</sup> In this case report, an atypical presentation of AWS was demonstrated to draw attention and to increase the awareness of clinicians that this condition (AWS) can develop in healthy subjects without any surgical interference.

## Case report

In July 2022, a 38-year-old male presented to a clinic at the King Fahd Medical Research Centre, Jeddah, Saudi Arabia with a subcutaneous fibrous cord extending from the axilla to his left arm. He complained of painful abduction of his left shoulder and pain in the left shoulder extending from the axilla to the medial aspect of the arm. He reported that the cord appeared 2 weeks prior to his attendance at the clinic and 2 days after repetitive physical activity using a jumping rope. He also reported that the cord was longer and more prominent once it appeared. The patient had no history of chronic illnesses. The patient had a family history of hypertension and type 2 diabetes mellitus. He was not on any medication, except esomeprazole, for gastric acidity and heartburn. On physical examination, he was apparently healthy with a body mass index (BMI) of 33.1 kg/m<sup>2</sup>. Inspection showed a 12 cm subcutaneous band or cord running from the left axilla to the medial side of the left arm

(Figure 1). The cord was fibrous and thin upon palpation. The patient was then diagnosed with AWS. The patient was advised to undergo self-massaging. The cord and its accompanying pain symptoms gradually resolved over 8 weeks without any need for analgesics (Figure 2). The reporting of this study conforms to CARE guidelines.<sup>11</sup> Written informed consent for publishing clinical data and images relevant to this case report was obtained from the patient.

## Discussion

In the literature, AWS typically has been reported as a result of axillary lymphadenectomy or sentinel node biopsy in patients



**Figure 1.** An image of a subcutaneous fibrous cord in the axillary area of a 38-year-old male. The subcutaneous fibrous cord extended from the axilla to his left arm. It measured approximately 12 cm long and it showed no skin changes. The colour version of this figure is available at: <http://imr.sagepub.com>.



**Figure 2.** An image showing the disappearance of the axillary cord in a 38-year-old male following 8 weeks of daily self-massage. The colour version of this figure is available at: <http://imr.sagepub.com>.

with breast cancer, possibly due to vascular or lymphatic injury.<sup>1,2</sup> It has been suggested that surgery can cause lymphatic thrombosis because of increased lymphatic fluid coagulation during the surgical procedure.<sup>2</sup> Lymphatic fluid can coagulate without any inducement and this coagulation can be stimulated by the existence of a plasma protein called thrombokinase.<sup>12</sup> After surgery and tissue injury, thrombokinase levels increase, which may explain the development of AWS after surgical intervention.<sup>13</sup> However, the full pathophysiological mechanism underlying AWS remains unclear. In this current case, the atypical presentation of AWS after physical exertion could be explained by lymphatic and venous damage induced by musculoskeletal activity. It has been proposed that external compression, which possibly occurs during repetitive elevation and movement of the arm while using a jumping rope, can cause localized lymphatic thrombosis.<sup>12</sup>

Two reports in the literature are in line with this current case report with respect to the appearance of AWS after physical exertion. The first study showed that AWS appeared after intense physical activity in a young male squash player and another report presented the development of AWS in an old female after home physical exercises.<sup>9,10</sup> Several risk factors are related to AWS, including ethnicity, BMI, extent of surgery, cancer management and axillary metastasis.<sup>2</sup> The incidence of AWS in individuals from African American backgrounds is higher than that in Caucasians and is higher in aggressive surgical procedures.<sup>1,2,14</sup> Regarding BMI, it was observed in previous studies that low BMI is associated with AWS due to decreased fatty subcutaneous tissue that makes the appearance of the cord more noticeable, which results in an easier diagnosis of AWS.<sup>14,15</sup> However, the BMI of the patient in this current case was not low (33.1 kg/m<sup>2</sup>) and the patient was categorized as having class I obesity based on the World Health Organization classification of obesity.<sup>16</sup> This contradicts previous findings and shows that a low BMI may not be consistently associated with the diagnosis of AWS. In this current case, the patient did not show any risk factors associated with AWS, which emphasizes the uncommonness of his presentation.

The symptoms observed in this current patient were typical of AWS, which included axillary and shoulder pain, limitation of shoulder movement and painful abduction on the affected side. The symptoms in this current case resolved after 8 weeks of daily self-massage. However, it is unclear whether the applied massage accelerated recovery or whether the case resolved spontaneously. Some studies recommend physiotherapy as a treatment for AWS and speculate that physiotherapy might speed up the healing of AWS.<sup>5,17</sup> Nevertheless, the disparate reported range of spontaneous resolution time makes it difficult to determine whether

physiotherapy can be a major contributor to AWS recovery.<sup>18–20</sup> Further research is required to strongly recommend physiotherapy for the primary management of AWS.

In conclusion, this case adds more evidence that AWS can be present not only in breast cancer patients or in patients that undergo surgery, but it can also be present in normal individuals and might be induced by physical exertion. The current report also highlights the necessity to consider AWS as a differential diagnosis of restricted range of motion and abnormal shoulder movements causing shoulder pain.

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### Declaration of conflicting interests

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