

**RISKS AFTER BREAST SURGERY**

**Quick Summary of Section**

**Axillary Web Syndrome (Cording)**

- Axillary Web Syndrome (AWS), also known as lymphatic cording, refers to a condition in which a rope-like soft-tissue density develops in the axilla, which may develop as a result of breast cancer treatment.

**What causes AWS?**

- The etiology of cording is not fully understood. The condition may be related to abnormalities in either the axillary vasculature or the lymphatics.

**Who is at Risk?**

- The incidence of cording after axillary lymph node dissection (ALND) has been reported as high as 72%, compared to 20% after sentinel lymph node biopsy (SLNB).

**AWS: Pink Ribbon Program®**

- Axillary web syndrome is a self-limiting and frequently overlooked cause of significant morbidity in the early post-operative period after breast cancer axillary surgery.

**Managing AWS by Breastcancer.org: Axillary Web Syndrome (Cording)**

- If you have symptoms of AWS, ask your doctor to refer you to a physical therapist or other medical professional (such as a nurse or physician) *who specializes in breast cancer rehabilitation*.

**Scar Tissue / Adhesions / Myofascial Release**

- Breast and axillary surgery, and radiotherapy in breast cancer patients cause scar tissue formation, fibrosis and adhesions at all levels of soft tissues of the upper body.
- Postural restoration through myofascial release (medical massage) is needed by most people, but especially those having significant scarring on the front of the body.

**Seroma / Compression**

- A serous fluid collection that develops under the skin flaps during mastectomy or in the axillary dead space after axillary dissection.

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### CORDING OR AXILLARY WEB SYNDROME (AWS)

<b>Axillary Web Syndrome (Cording)</b>	<p>Axillary Web Syndrome (AWS), also known as lymphatic cording, refers to a condition in which a rope-like soft-tissue density develops in the axilla, which may develop as a result of breast cancer treatment. It usually appears in the 5 to 8 week period following breast cancer surgery and can lead to shoulder pain and restricted motion.</p> <p><i>NCBI: PMC: Atypical presentation of axillary web syndrome</i></p> <p>Cords are palpable bands of tissue which can occur in the axilla, across the antecubital fossa into the forearm and wrist, and in the breast or abdominal wall. The incidence of cording following breast cancer treatment ranges from 6 – 72%, and the condition can cause pain and limited range of motion in the upper extremity.</p> <p><i>NCBI: PMC: Cording Following Treatment for Breast Cancer</i></p> <p><b>When does it happen:</b></p> <ul style="list-style-type: none"> <li>• Typically 3-4 weeks post – op.</li> <li>• Less often 2-4 weeks</li> <li>• Less often over 4 weeks</li> </ul> <p><i>Klose: Breast Cancer Rehabilitation</i></p> <p><b>Mondor disease</b> is a rare condition that is characterized by scarring and inflammation of the veins located just beneath the skin of the chest. The affected veins are initially red and tender and subsequently become a painless, tough, fibrous band that is accompanied by tension and retraction of the nearby skin. In most cases, the condition is benign and resolves on its own; however, Mondor disease can rarely be associated with breast cancer.</p> <p>Although the condition most commonly affects the chest, Mondor disease of other body parts (including the penis, groin, and abdomen) has been described, as well. Mondor disease is thought to occur when pressure or trauma on the veins causes blood to stagnate. In most cases, the condition arises after recent breast surgery, but it can also be associated with physical strain and/or tight-fitting clothing (i.e. bras). Treatments are available to help relieve symptoms until the condition resolves.</p> <p><i>NIH: NCATS: Mondor Disease</i></p>
<b>What causes AWS</b>	<p>The etiology of cording is not fully understood. The condition may be related to abnormalities in either the axillary vasculature or the lymphatics.</p> <ul style="list-style-type: none"> <li>• Anatomic studies of resected cords reveal that these structures may represent dilated and thrombosed lymphatics and/or thrombosed superficial veins.</li> <li>• The condition is considered to be a variation of (Mondor’s disease (<i>See below</i>), a rare thrombophlebitis of the subcutaneous veins caused by trauma such as surgery.</li> </ul> <p><i>NCBI: PMC: Cording Following Treatment for Breast Cancer</i></p> <ul style="list-style-type: none"> <li>• AWS: may be attributed to lymph venous injury during axillary lymph node dissection due to either tissue retraction and/or patient positioning.</li> <li>• Another theory is that because of the interruption in axillary flow, lymphatic vessels are dilating and scalloping to the skin.</li> </ul> <p><i>Summit Education: Oncology Rehab Dec 12, 2019</i></p>

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<b>Who is at Risk?</b>	<p>The incidence of cording after axillary lymph node dissection (ALND) has been reported as high as 72%, compared to 20% after sentinel lymph node biopsy (SLNB).</p> <ul style="list-style-type: none"><li>• Younger age, lower BMI, and being African-American have also been implicated as potential risk factors.</li><li>• While cording has been reported to cause limited range of motion, the extent to which this translates into dysfunction performing daily functional reaching activities has yet to be reported.</li><li>• Little data exists on whether cording is associated with an increased risk of developing upper extremity lymphedema.</li></ul> <p><i>NCBI: PMC: Cording Following Treatment for Breast Cancer</i></p> <p><b>Body habitus:</b></p> <ul style="list-style-type: none"><li>• Pt's that have AWS were found to be more often of lower weight with a BMI between 23-25.</li><li>• Pt's that were obese with a BMI between 26-28.9, unlike with lymphedema, tend to have a lower incidence of cording.</li></ul> <p><i>Klose: Breast Cancer Rehabilitation.</i></p>
<b>Axillary Web Syndrome by Pink Ribbon Program®</b>	<p>Axillary web syndrome is a self-limiting and frequently overlooked cause of significant morbidity in the early post-operative period after breast cancer axillary surgery, which is characterized by axillary pain that runs down the medial arm, limited shoulder range of motion affecting mainly shoulder abduction, and cords of subcutaneous tissue extending from axilla into the medial arm, made visible or palpable and painful by shoulder abduction.</p> <ul style="list-style-type: none"><li>• In addition, soft tissue may give a cordlike appearance due to increased tension between the skin of the upper arm and adherence of an axillary scar to underlying fascia.</li><li>• Lymphatic cording is associated with pain and limitation of shoulder movement, and it is common to find shoulder abduction restricted to less than 90°.</li><li>• Exercise interventions should typically include supine exercises involving assisted shoulder flexion, active abduction, horizontal abduction, and a trunk rotational stretch with shoulder abduction, stretching exercises for levator scapulae, upper trapezius, pectoralis major, and medial and lateral rotators muscles of the shoulder.</li></ul> <p><i>Pink Ribbon Program®</i></p>

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### Managing AWS

by  
**Breastcancer.org:**  
**Axillary Web**  
**Syndrome**  
**(Cording)**

If you have symptoms of AWS, ask your doctor to refer you to a physical therapist or other medical professional (such as a nurse or physician) *who specializes in breast cancer rehabilitation*. It's not a good idea to wait and see if the condition will resolve on its own. Your natural reaction to the pain of cording will be to avoid moving the arm and shoulder, which can lead to more tightness in the shoulder and chest area. Over time, this may cause more serious problems with function and mobility. Moving and stretching under the guidance of an experienced therapist are the best ways to resolve the condition and stop the pain.

Together, you and your therapist can develop a treatment plan that's right for you. Your plan may include:

- **Stretching and flexibility exercises:** Your therapist can work with you to help you learn exercises that gently stretch the cords and improve your pain-free range of motion. He or she can teach you exercises to do at home and advise you on how often to do them.
- **Manual therapy:** Your therapist also may gently massage the cord tissue. Using manual therapy, your therapist would gently pull the tissue on your outstretched arm, starting in the upper arm and moving down into the forearm. This sometimes causes the cord to snap or break, and you may even hear a popping sound when that happens. It's usually not painful, and it often brings relief by extending your arm's pain-free range of motion.
- **Moist heat:** Your therapist may apply warm, moist pads directly to the cords as part of therapy. However, it's important that he or she use caution when doing this. Prolonged heat can increase the production of lymph, which can lead to the fluid overload known as lymphedema. If your therapist recommends moist heat, just be sure he or she is experienced in its use for cording.
- **Pain medication:** You may need to take some form of pain medication, such as an NSAID (non-steroidal anti-inflammatory drug, such as Motrin or aspirin), if you experience pain that prevents you from stretching the arm. But remember that the best treatment for the pain is doing the stretching exercises that help the condition get better.
- **Low-level laser therapy:** Some therapists use a small, hand-held device to apply low-level laser beams directly to the skin. Laser therapy can help break down the hardened scar tissue.
- **With the exception of pain medication, all of these treatments focus on releasing the tight scar tissue that makes up the cord(s).** You may notice that releasing the cord in certain parts of the arm can magnify the tightness in other areas — not because the cording is getting worse, but because the scar tissue is still "stuck" in those other areas. For example, releasing the cord in the upper arm and elbow will reduce pain and improve range of motion, but the wrist and forearm may feel tighter at first. "I describe the cord to my patients as being like a fishing line that is stuck in several places along the fishing rod," says Nicole Stout, MPT, CLT-LANA, physical therapist and lymphedema specialist, the Breast Care Center, National Naval Medical Center. "You can release a few of the stuck spots, but it then magnifies the tightness in the other areas that are still stuck."

Fortunately, cording usually resolves for most people after a few therapy sessions, or at least within a few months.

- It's possible to have limited range of motion for many months or even longer, but that's not typical. For some people, cording may get better and then come back later, but usually cording is a one-time event that doesn't become a persistent problem.
- Experts still aren't exactly sure what happens to the cords after they break down. Some experts believe that they simply get reabsorbed by the body, but other experts say that we simply don't yet know what happens to the cords.

*Breastcancer.org Axillary Web Syndrome (Cording)*

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## SCAR TISSUE / ADHESIONS / MYOFASCIAL RELEASE

### Scar Tissue / Adhesions

An adhesion is a band of scar tissue that binds 2 parts of your tissue that are not normally joined together. Adhesions may appear as thin sheets of tissue similar to plastic wrap or as thick fibrous bands. The tissue develops when the body's repair mechanisms respond to any tissue disturbance, such as surgery, infection, trauma, or radiation. *Web MD: Adhesions, General and After Surgery*

Breast and axillary surgery, and radiotherapy in breast cancer patients cause scar tissue formation, fibrosis and adhesions at all levels of soft tissues of the upper body.

- The occurrence or persistence of upper limb impairments after breast cancer treatment can partially be explained by the presence of myofascial dysfunctions (*fascia surrounding and separating muscle tissue*).
- Myofascial dysfunctions are expressed as myofascial trigger points and adhesions or restrictions of the myofascial tissues.
- The latter are impairments of gliding of the myofascial tissues relative to each other.
- Muscle manipulation during surgery, scar tissue formation, soft tissue adhesions and adaptive postures following surgery or fibrosis from radiotherapy can cause myofascial adhesions. *NCBI: An evaluation tool for Myofascial Adhesions*

According to *Klose (K)* and *BreastCancer.org (B)*, tissue adhesion can cause:

- Pain (*K*)
- Postural changes (*K*)
- Impaired shoulder function (*K*)
- Movement compensations (*K*)
- Nerve pain or numbness if scar tissue forms around nerves. (*B*)
- A lump of scar tissue forms in the hole left after breast tissue is removed. If scar tissue forms around a stitch from surgery it's called a suture granuloma and also feels like a lump. (*B*)
- Changes in breast appearance. Scar tissue and fluid retention can make breast tissue appear a little firmer or rounder than before surgery and/or radiation. (*B*)

*Klose: Breast Cancer Rehabilitation (K)* and *BreastCancer.org: Scar Tissue Formation (B)*

### Myofascial Release

Postural restoration through myofascial release (medical massage) is needed by most people, but especially those having significant scarring on the front of the body.

- These scars draw the shoulders forward causing the head and neck to also pull forward. This leads to neck and shoulder aches and pains.
- The body is meant to be in alignment. When we live and move in non-optimal alignment, serious orthopedic injuries can occur.
- Most commonly, I have seen breast cancer survivors develop neck and shoulder impingement. Neck and shoulder impingement can cause shooting pain down the arm and lead to another surgery. Impingement syndromes start with achiness in the neck and shoulders.
- Myofascial release is a type of medical massage that is NOT painful. Focus is placed on gently releasing tension along thickenings of fascia and scar tissue. Releasing this tension restores posture and alignment. It also relieves knots and painful areas in all parts of the body.

*Breast Cancer Resource Center: Benefits of Myofascial Release Therapy after Mastectomy & Lumpectomy*

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## SEROMA / COMPRESSION

### Seroma

A serous fluid collection that develops under the skin flaps during mastectomy or in the axillary dead space after axillary dissection.

- Incidence of seroma formation after breast surgery varies between 2.5% and 51% .
- Although seroma is not life threatening, it can lead to significant morbidity:
  - Flap necrosis
  - Wound dehiscence
  - Predisposes to sepsis
  - Prolonged recovery period
  - Multiple physician visits
  - May delay adjuvant therapy.
- Fluid collection is ideally managed by repeated needle aspiration to seal the skin flaps against the chest wall.
- Several factors have been investigated as the cause of seroma formation these include
  - Duration of wound drainage
  - Use of pressure garment
  - Postoperative arm activity
  - Preoperative chemotherapy
  - Use of electrocautery

*NCBI: Seroma formation after surgery for breast cancer*

### Compression

Acute Management with Compression:

- Compression with pads and elastic garments
- Apply immediate compression after aspiration, when possible

Seroma Management Body Shapers:

- Avoid shelf bras
- Look for wide straps and good trunk coverage
- Breast cup vs. flat fabric design (depending on surgery)
- Ensure coverage into the axilla
- Nighttime use if large breasted: daytime use if supportive enough to be used as a bra
- If currently on radiation, consult radiation oncologist

*Klose: Breast Cancer Rehabilitation*

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Breast Cancer Resource Center: Benefits of Myofascial Release Therapy after Mastectomy & Lumpectomy

<https://bcrc.org/benefits-myofascial-release-therapy-mastectomy-lumpectomy/>

Breastcancer.org Axillary Web Syndrome (Cording) [https://www.breastcancer.org/treatment/side\\_effects/aws](https://www.breastcancer.org/treatment/side_effects/aws)

BreastCancer.org: Scar Tissue Formation [https://www.breastcancer.org/treatment/side\\_effects/scar\\_tissue](https://www.breastcancer.org/treatment/side_effects/scar_tissue)

Klose: Breast Cancer Rehabilitation <https://klosetraining.com/>

NCBI: Seroma formation after surgery for breast cancer <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC543447/>

NCBI: An evaluation tool for Myofascial Adhesions in Patients after Breast Cancer

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5844553/#:~:text=Breast%20and%20axillary%20surgery%20and,level%20and%20deeper%20myofascial%20structures.>

NCBI: PMC: Atypical presentation of axillary web syndrome (AWS)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5178020/>

NCBI: PMC: Cording Following Treatment for Breast Cancer <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3786257/>

NIH: NCATS: Mondor Disease: <https://rarediseases.info.nih.gov/diseases/7054/mondor-disease>

Pink Ribbon Program® <https://www.pinkribbonprogram.com/>

Summit Education: Oncology Rehab Dec 12, 2019 - <https://summit-education.com/>

Web MD: Adhesions, General and After Surgery <https://www.webmd.com/a-to-z-guides/adhesion-general-post-surgery#1>