Seromas: The Ins and Outs

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ABSTRACT: **The following case study will review seroma classifications, patient scenarios, and interventions as well as nursing interventions. Seromas comprise of a fluid-occupying space in the postsurgical patient. There are a variety of seroma interventions based on the type, frequency, and location. The goal is reduce further reaccumulation of serous fluid and prevent fluid from becoming infected. It is essential to provide proper patient teaching and use collaborative care among radiology nurses, technologists, interventional radiologists, and surgeons. (J Radiol Nurs 2014;33:116-120.)**

KEYWORDS: **Seroma; Drains; Radiology; Postsurgical; Radiology Nursing.**

BACKGROUND

A seroma is defined as a collection of serous fluid under the skin within the cavity of the postoperative area usually along the surgical incision. The signs and symptoms of a seroma are erythema, pain, edema, and protuberance of the area. Patients may exhibit fever, chills, and/or rigors with associated pain. The treatment varies from aspiration of the fluid to sclerosing agents. The goal is complete resolution of the seroma and the associated pocket.

Seromas occur primarily within the surgical site where tissue has been removed. During a surgical intervention, there is some tissue trauma particularly to the microvasculature. This trauma creates leakage of serous protein fluid from the intravascular space into the surrounding tissues. The surgical site, where tissue was removed, has an empty pocket where the dependent fluid accumulates (Lehr & Schuricht, 2013). The increased pressure of the fluid creates pain. If the fluid remains without intervention, there is an increased risk of it evolving into an infection.

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Classifications of Seromas

There are five types or classifications of seromas developed by Morales-Conde (2012) (see Table 1). Treatment plans focus on the patient's clinical presentation, type of seroma, and successful outcomes.

Type 0 is no clinical evidence of seroma, but the patient is a postoperative patient. This classification is meant to keep a close clinical eye on the postoperative patient. This class is subdivided into two types. Type 0a is no clinical or radiologic evidence of seroma. This area is defined by postsurgical changes within the area of tissue removal. Type 0b is a seroma that is detected by radiological imaging, but no clinical manifestation. The patient does not have clinical symptoms of the seroma, but a seroma is developing.

Type 1 is a clinical seroma lasting less than 1 month. There is clinical and radiologic evidence of the seroma. Patients will have symptoms of vague fullness and pressure in the affected area.

Type 2 is a clinical seroma lasting for more than 1 month. This group is also subdivided into two groups. Type 2a is a seroma that lasts 1 to 3 months. Type 2b seromas last between 3 and 6 months. Some of these seromas will resolve on their own without any intervention.

Type 3 seromas are symptomatic seromas requiring medical treatment. There may be minor seroma-related complications, which include a seroma lasting more than 6 months, esthetic complaints of "bulging" of the area, discomfort related to the seroma that inhibits activities of daily living, pain, and superficial cellulitis.

Type 4 is a major seroma that requires urgent medical treatment. These seroma complications include puncture of seroma, spontaneous drainage, abscess formation,

Table 1. Seroma classification

Type 0	No clinical evidence of seroma, but postoperative patient
Type 0a	No clinical or radiologic evidence of seroma, but postoperative
Type 0b	Radiologic evidence of seroma
Type 1	Clinical evidence of seroma lasting less than 1 month
Type 2	Clinical evidence of a seroma lasting more than 1 month
Type 2a	A seroma lasting between 1 and 3 months
Type 2b	A seroma lasting between 3 and 6 months
Type 3	Symptomatic seroma requiring minimal intervention
Type 4	Urgent seroma requiring immediate medical treatment

recurrence, and/or abdominal mesh rejection. This category usually requires surgical intervention.

Pathology

There is still some controversy as to how seromas form. However, the pathophysiology of the traumatic tissue injury postsurgery is inflammatory in nature. The microvasculature is damaged and the serous fluid flows from the microvasculature into dependent spaces. Thus, the formation of a seroma occurs. Seromas are part of the natural wound healing process, but become bothersome when they are not resolved naturally. These require extraneous intervention, either radiological or surgical (Srivastava, Basu, & Kumar Shukla, 2012).

Clinical Presentation

Patients with a seroma are usually 1 to 2 weeks from their surgical intervention. The surgical site may be erythemic, edematous, protuberant, and painful. The surgical site may be dehiscent, or it may leak the seroma material. Patients may exhibit fever, chill, and/or rigors as either the inflammatory process or impending infection. It is essential to obtain a detail history and physical examination to narrow the causative agent, either inflammatory or infectious, and plan for appropriate care.

Treatment options include, but not limited to, surgical flap suturing at the time of procedure. Radiologic interventions include ultrasound-guided aspiration with and without drainage catheter placement; computed tomography (CT) aspiration with and without drainage catheter placement; and, also, the use of sclerosing agents.

CASE REPORT

The following three case reports are of three individuals with three separate surgical interventions all resulting in seroma formation. Each patient was treated with radiologic procedures. Each patient was treated independently based on clinical presentation and surgical history.

Case Study #1

The case study #1 involves a 62-year-old female with a history of abdominoplasty revision. Her chief complaint was a "bulging" above her umbilicus. Patient's initial abdominoplasty procedure occurred in 1999. Patient underwent subsequent revision of her abdominoplasty in 2011. Patient developed a loculated seroma to her abdomen after her abdominoplasty revision. A CAT scan (CT) of the abdomen and pelvis revealed radiographic evidence of seroma. The patient was scheduled for ultrasound-guided aspiration of anterior abdominal wall seroma. The patient's clinical and radiographic picture classifies her into Type 3 on the seroma classification.

The patient was positioned supine and a linear array transducer was used to visualize the seroma. The area was prepped and draped in the usual sterile fashion. Lidocaine 1% was infiltrated superficially to seroma. Under direct ultrasound visualization, a 6-French safety centesis needle with catheter was inserted into the collection (Figure 1). Thin serous fluid was withdrawn. The catheter was removed and the wound sterilely dressed. Approximately 35 cc of fluid was removed (Figures 2 and 3). Patient tolerated the procedure well. During the follow-up, there was no evidence of infection or reaccumulation of seroma.

Case Study #2

Case study #2 is that of a 38-year-old female with a history of morbid obesity and Roux-en-Y gastric bypass with hiatal hernia repair in the summer of 2011. One year later, the patient had a laparoscopic revision of her Roux-en-

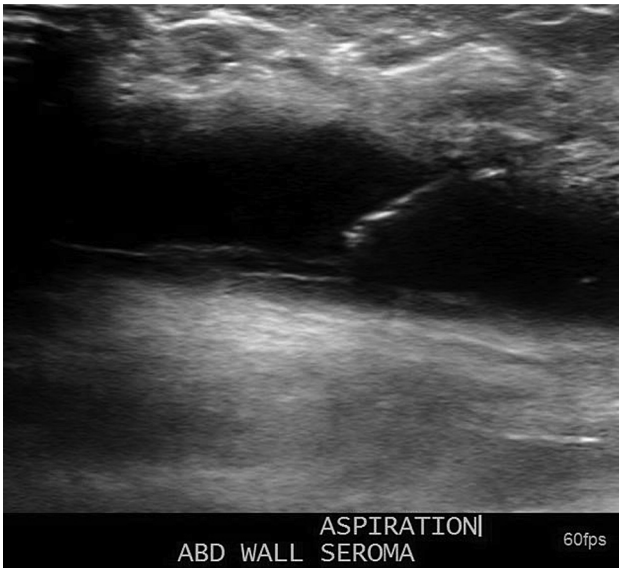

Figure 1. This image shows the insertion of the needle within the seroma space. Approximately 35 cc of amber-colored fluid was removed. Images courtesy of Cleveland Clinic.