



**Received:** 23 November, 2020

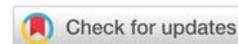
**Accepted:** 08 April, 2021

**Published:** 10 April, 2021

**\*Corresponding authors:** Dr. Julia Glizevskaja, Department of Cardiothoracic Surgery, Wythenshawe Hospital, Southmoor Road, Manchester M23 9LT, United Kingdom, Email: [j.glizevskaja@nhs.net](mailto:j.glizevskaja@nhs.net)

**Keywords:** Seroma; Imaging; Wound complications; Sternal wound

<https://www.peertechzpublications.com>



## Case Report

# Seroma after sternal wound debridement: Case report

Julia Glizevskaja\*, Mohammed Abbas and Nnamdi Nwaejike

Department of Cardiothoracic Surgery, Wythenshawe Hospital, Manchester University NHS Foundation Trust, Manchester, United Kingdom

## Abstract

Seroma formation is a common complication of any surgery producing a significant dead space or causing disruption of the lymphatic drainage. Although this is uncommonly reported in cardiac surgery. Such collections can cause localized pain, wound dehiscence, infection and can reoccur frequently, requiring multiple interventions. We present case of large sternal wound seroma after wound debridement with Computed tomography imaging for the patient, that initially underwent Coronary artery bypass grafting.

## Abbreviations

CABG: Coronary Artery Bypass Grafting; CT: Computed Tomography

## Introduction

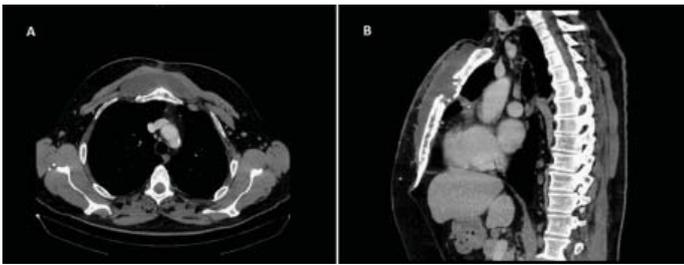
Operations involving extensive soft tissue surgery and disrupting lymphatic drainage may result in a postoperative seroma. Although this is uncommonly reported in sternal wounds after cardiac surgery. Such collections can cause localized pain, wound dehiscence, infection and can reoccur frequently, requiring multiple interventions. We present case of sternal wound seroma after wound debridement.

## Case presentation

57 years old male developed chronic sternal wound sinus following CABG and required multiple courses of antibiotics. His risk factors of wound infection included bilateral mammary arteries harvest, long term smoker, use of systemic immunosuppressant and topical steroid creams for severe dermatitis. He firstly underwent one culpable sternal wire removal 6 months following CABG. Limited strategy was used to minimise wound infection risk in patient with severe skin conditions. Following another 6 months he developed further sinus lower to the previous one, therefore decision made to proceed with all sternal wires removal. He underwent elective sternal wound debridement, excising previous sternotomy scar and removing all remaining sternal wires. Intraoperatively

he was found to have bone involving, and precise wound debridement was performed including debridement of unhealthy bone segment, living around 3x1x0.5cm sternal defect without penetration to mediastinum or disturbing sternal stability. To approximate wound edges, bilateral skin flaps with underlying subcutaneous tissues were prepared. Wound closed layered, living Redon Redovac drain (PFM Redon system, Mepro, Koln Germany) in both pockets. Postoperatively patient made good recovery, he remained in hospital while drains were in situ, draining 300 ml of hemo-serous fluids over first 24 hours. After drainage gradually reduced, drains were removed on day 5 and patient was discharged home. Intra-operative wound swab came back negative.

He presented to our department 2 weeks later with large fluctuating non painful swelling over sternotomy wound. There were no signs of infection, sternal wound has healed well, his inflammatory markers were within normal limits. At admission he underwent a CT scan, which demonstrated large 3.4x10.8x18.8cm collection subcutaneously anterior to the sternum; the fluid collection did not contain locules of gas (Figure 1). There was no connection of seroma with mediastinum and there was no pericardial effusion. We proceed with drainage of collection under local anaesthesia using vacuum-assisted drainage, as described by Fitzgerald and Charles [1,2] and evacuated 150ml of serous fluids with immediate improvement. Patient was discharged home same day. He was seen in our follow-up clinic in 2 weeks time, unfortunately at that point seroma has re-accumulated. After discussion with the patient, conservative



**Figure 1:** Computed tomography demonstrated large 3.4 x 10.8 x 18.8 cm collection subcutaneously anterior to the sternum. (A) Axial view. (B) Sagittal view.

“watch-and-wait” approach was selected. By the mean time we referred him to his dermatologist for relapse of dermatitis. At the further follow-up in 3 months time seroma has completely resolved, at the same time following adjustment in dermatological treatment his skin condition has significantly improved.

## Discussion

A seroma is a serum collection that develops as a response to trauma/injury such as surgery. Seroma formation is a known complication of various types of surgeries. So far described published cases of seroma in cardiac surgery were cases of groin seromas as complication of peripheral cannulations.

The presence of seroma in a wound might delay the wound healing and becomes medium for bacterial growth. Factors predisposing to sternal wound complications (including seroma) are diabetes, obesity, long operation duration, redo sternotomy, mechanical ventilation longer than 72 hours and smoking [3,4].

Few studies reported superficial sternal wound infection rate between 0.5–6.4%, while deep sternal wound infection between 0.22–1.6% [5,6]. Trans-sternal seromas post thymectomies are uncommon complications as incidence rate described by Kas et al. about 0.9% [7]. On the other hand, up to 35% of patients who undergo mastectomy develop seroma [8]. During our literature review (through PubMed), we could not find specific incident rate or risk factors for seroma in cardiac surgery.

## Conclusion

We presented a rare case of large sternal seroma after sternal wound debridement with instructive images from CT scan. Multiple management strategies of seromas are known, including conservative management and observation, multiple drainages and aspirations, wound re-exploration, sclerotherapy. We have chosen initially percutaneously aspirate seroma, however following re-accumulation it was left for watch-and-wait tactic, which eventually lead to complete resolving of seroma at 3 months follow-up.

In this man’s case we have observed, that addressing severe skin pre-condition has facilitated clearance of large seroma

with conservative approach. We believe that combination of exacerbation of dermatitis and extensive exfoliation of the subcutaneous tissues were main factors of seroma formation in our case.

## Acknowledgement

The authors received no financial support for the authorship or publication of this article.

## References

1. Fitzgerald JEF, Hayes AJ, Strauss DC (2011). Vacuum-assisted sterile drainage of large post-operative seromas: the Royal Marsden technique. *Ann R Coll Surg Engl* 93: 646–647. [Link: https://bit.ly/3uBQDcn](https://bit.ly/3uBQDcn)
2. Charles JB, Samer S, Pari-Naz M (2010). A closed vacuum drainage system for the management of postoperative seromas. *Ann R Coll Surg Engl* 92: 354–355. [Link: https://bit.ly/3mu3tqs](https://bit.ly/3mu3tqs)
3. Wouters R, Wellens F, Vanermen H, De Geest R, Degrieck I, et al. (1994). Sternalitis and mediastinitis after coronary artery bypass grafting. Analysis of risk factors. *Tex Heart Inst J* 21: 183-188. [Link: https://bit.ly/3mFJeX7](https://bit.ly/3mFJeX7)
4. Milano CA, Kesler K, Archibald N, Sexton DJ, Jones RH (1995) Mediastinitis after coronary artery bypass graft surgery. Risk factors and long-term survival. *Circulation* 92: 2245-2251. [Link: https://bit.ly/3dDIwq0](https://bit.ly/3dDIwq0)
5. Ridderstolpe L, Gill H, Granfeldt H, Ahlfeldt H, Rutberg H (2001) Superficial and deep sternal wound complications: incidence, risk factors and mortality. *Eur J Cardiothorac Surg* 20: 1168-1175. [Link: https://bit.ly/3dOmvUq](https://bit.ly/3dOmvUq)
6. Salehi Omran A, Karimi A, Ahmadi SH, Davoodi S, Marzban M, et al. (2007) Superficial and deep sternal wound infection after more than 9000 coronary artery bypass graft (CABG): incidence, risk factors and mortality. *BMC Infect Dis* 7: 112. [Link: https://bit.ly/3cYwiYN](https://bit.ly/3cYwiYN)
7. Kas J, Kiss D, Simon V, Svastics E, Major L, et al. (2001) Decade-long experience with surgical therapy of myasthenia gravis: early complications of 324 transsternal thymectomies. *Ann Thorac Surg* 72: 1691-1697. [Link: https://bit.ly/3s1rxSw](https://bit.ly/3s1rxSw)
8. Hashemi E, Kaviani A, Najafi M, Ebrahimi M, Hooshmand H, et al. (2004). Seroma formation after surgery for breast cancer. *World J Surg Onc* 2: 44. [Link: https://bit.ly/390tMTd](https://bit.ly/390tMTd)

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

### Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds’ renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEIO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.