

# Symptomatic subcutaneous mass in a police officer: An underrecognized occupational complication



Brandon A. Poff, BS, and Adam Aronson, MD

**Key words:** duty Belt; police officer; subcutaneous mass; occupational health; fibroadipose tissue; cystic degeneration; pseudocyst; bursa; pain.

## INTRODUCTION

In many police departments, the use of duty belts is mandatory. When fully equipped, these belts hold all of an officer's tools and weapons and typically weigh approximately 7 to 8 kg (15.4-17.6 lbs). A fully equipped duty belt will hold a police officer's gun, baton, ammunition, radio, handcuffs, taser, pepper spray, and flashlight. The belt is typically made of thick leather, contributing to its overall weight. Tactical gear, consisting of a gas mask and emergency personal protective equipment, increases the weight to 8.5 to 9.5 kg (18.7-21 lbs). Owing to the weight and design of these belts, discomfort, pain, and musculoskeletal disorders are commonly reported among active duty police officers.<sup>1-3</sup> Additionally, discomfort from wearing mandatory equipment is associated with multisite musculoskeletal pain.<sup>4</sup> Significant changes in spatiotemporal and kinetic gait parameters have been found with the carriage of police equipment for both men and women.<sup>5</sup> We present a novel case of a duty belt complication in a female police officer. The police officer underwent surgery to remove a symptomatic mass on her left iliac crest mimicking a lipoma.

## CASE REPORT

A 45-year-old woman working as a highway patrol officer for 12 years presented with a several-month history of a slowly growing and tender soft tissue mass overlying her left iliac crest. She had no

pertinent medical history regarding arthritis or other soft tissue growths. Examination revealed an approximately 7 × 4 cm ovoid spongy nodule with mild overlying erythema on the left iliac crest (Fig 1, A). Clinical impression was consistent with a lipoma, which was believed to have become irritated and painful because of the pressure and friction from occupational use of a duty belt. The patient noted that pain was most significant while wearing the duty belt. The patient desired definitive treatment; therefore, an excision was performed. During surgery, atypical features were noted, as the mass was easily identified and observed to be paler and more fibrous in appearance than a typical adipose tissue (Fig 1, B). This mass was found to extend substantially farther subclinically along the bone than was apparent on physical examination. Histologic analysis showed fibro-adipose connective tissue with cystic degenerative changes interpreted as a "resolving degenerate pseudocyst (possibly a bursa or bursa-like process)." No cyst wall or other true epithelial lining was present. The noted features were considered secondary to trauma or chronic irritation (Fig 1, C, D). In combination with the clinical presentation and history, findings were most consistent with a cutaneous metaplastic synovial cyst, an uncommonly reported form of pseudocyst that most typically develops at sites of previous surgery or trauma or occasionally with severe rheumatoid arthritis.<sup>6</sup>

From the Skin Cancer and Reconstructive Surgery Center, Newport Beach, California.

Funding sources: Skin Cancer and Reconstructive Surgery Foundation.

IRB approval status: Not applicable.

Consent for the publication of all patient photographs and medical information was provided by the authors at the time of article submission to the journal stating that all patients gave consent for their photographs and medical information to be published in print and online and with the understanding that this information may be publicly available.

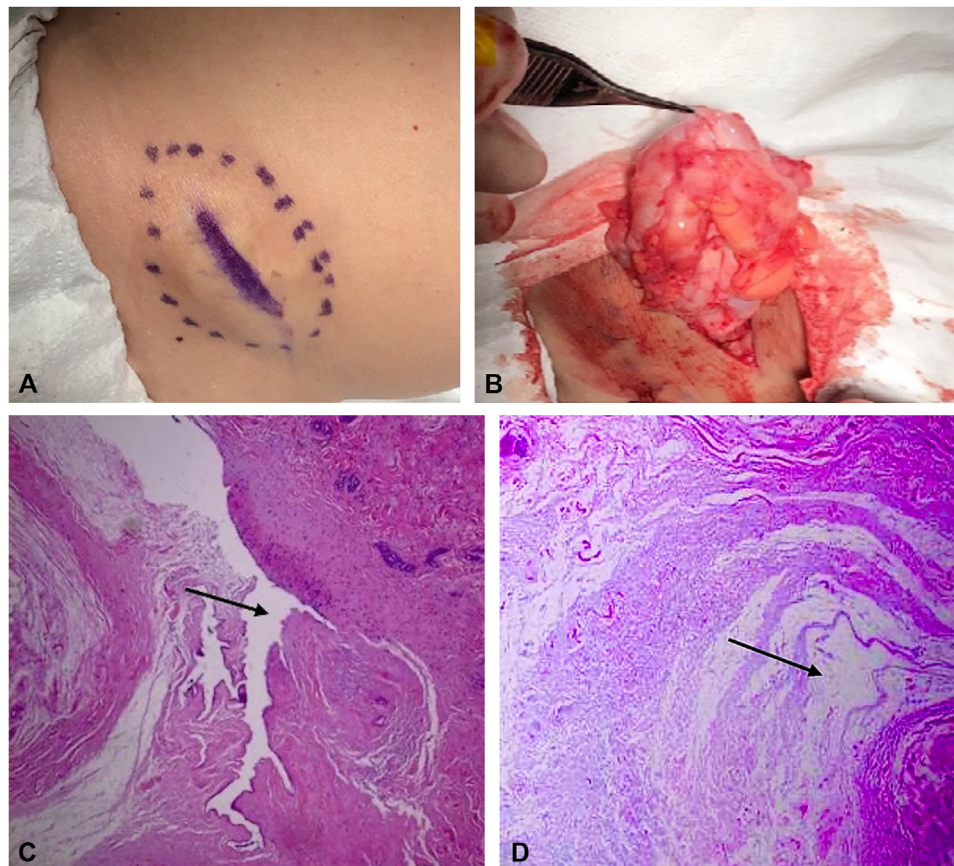
Correspondence to: Adam Aronson, MD, Skin Cancer and Reconstructive Surgery Center, 180 Newport Center Dr. Suite 158, Newport Beach, CA 92660. E-mail: [adamaronsonmd@gmail.com](mailto:adamaronsonmd@gmail.com).

JAAD Case Reports 2023;36:102-4.

2352-5126

© 2023 by the American Academy of Dermatology, Inc. Published by Elsevier, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.jidcr.2023.04.020>



**Fig 1.** Intraoperative photographs and pathology. **A**, Preoperative estimated size of mass (marked in *purple dots*) of  $7 \times 4$  cm. Actual size was approximately twice as large. **B**, Intraoperatively the mass was composed of lobulate pale connective tissue well demarcated from surrounding adipose tissue. **C**, Cystic degenerative changes with clefting are seen adjacent to unremarkable connection tissue (pink/red). **D**, In the adjacent area, more extensive cystic degenerative changes are seen (*loose blue/purple region*). (**C** and **D**, Hematoxylin-eosin stain; original magnifications: **A**, 2.5 $\times$ ; **B**, 2.5.)

The patient's duty belt included a hard plastic belt attachment for her baton (circled), which rested on her left iliac crest (Fig 2, A). The patient reported consistent pressure on her hip from this belt attachment such that she was unable to position this attachment anywhere else where it would be within reach and conform to her department's mandates (Fig 2, B). Chronic irritation and pressure from this plastic attachment appeared the most likely cause of this lesion. Continued contact exacerbated pain and discomfort and may have contributed to its growth.

Postoperatively, the mass resolved and has not recurred at 1 year after the procedure, although the patient has a noticeable subcutaneous deficit at this site with skeletonization of her left hip. She continues to experience chronic pain in the area primarily exacerbated by continued duty belt use. She is

undergoing treatment by a pain management physician and has not yet been able to return to unrestricted active duty because of her department's mandate to always wear a duty belt.

## DISCUSSION

Mandatory use of heavy-duty belts represents an occupational health hazard. Complications related to duty belt usage may result in patients seeking treatment from a dermatologist, as in this case. To date, this type of complication has not been described in dermatologic literature, and so may be underrecognized by dermatologists. Identification of these complications is essential so that police departments and other occupations which may require duty belts, such as automotive technicians, construction workers, industrial repair technicians, and



**Fig 2.** Duty belt and demonstration. **A**, Laden duty belt. The *circled* attachment was in direct contact with the patient's left iliac crest, where the mass developed. Note the hard plastic edges and corners of the belt attachment. **B**, Individual wearing a fully laden duty belt with required equipment in proper places.

carpenters, can make changes as necessary to preserve the health of their employees. For example, duty vests have been developed to take pressure off of the user's hips and spine. Although duty vests have been shown to produce fewer complaints and complications than duty belts, these are not currently in widespread use or available in all police departments.<sup>7</sup>

We would like to thank Dr. Ken Cantos and Dr. Jina Chung for the microscopic photographs and interpretation.

#### Conflicts of interest

None disclosed.

#### REFERENCES

1. Filtner AJ, Mitsopoulos-Rubens E, Rudin-Brown CM. Police officer in-vehicle discomfort: appointments carriage method and vehicle seat features. *Appl Ergon.* 2014;45(4):1247-1256. <https://doi.org/10.1016/j.apergo.2014.03.002>
2. Ramstrand N, Larsen LB. Musculoskeletal injuries in the workplace: perceptions of Swedish police. *Int J Police Sci Manag.* 2012; 14(4):334-342. <https://doi.org/10.1350/ijps.2012.14.4.293>
3. Ramstrand N, Zügner R, Larsen LB, Tranberg R. Evaluation of load carriage systems used by active duty police officers: relative effects on walking patterns and perceived comfort. *Appl Ergon.* 2016;53(A):36-43. <https://doi.org/10.1016/j.apergo.2015.08.007>
4. Larsen LB, Andersson EE, Tranberg R, Ramstrand N. Multi-site musculoskeletal pain in Swedish police: associations with discomfort from wearing mandatory equipment and prolonged sitting. *Int Arch Occup Environ Health.* 2018;91(4):425-433. <https://doi.org/10.1007/s00420-018-1292-9>
5. Kasović M, Štefan L, Borovec K, Zvonar M, Cacek J. Effects of carrying police equipment on spatiotemporal and kinetic gait parameters in first year police officers. *Int J Environ Res Public Health.* 2020;17(16):5750. <https://doi.org/10.3390/ijerph17165750>
6. Kermani H, Dehghani N, Dehghani S, Behnia H, Pourdanesh F, Mohajerani H. Cutaneous metaplastic synovial cyst: a case report and literature review. *Iran Red Crescent Med J.* 2015; 17(12):e22467. <https://doi.org/10.5812/ircmj.22467>
7. Larsen LB, Ramstrand N, Tranberg R. Duty belt or load-bearing vest? Discomfort and pressure distribution for police driving standard fleet vehicles. *Appl Ergon.* 2019;80:146-151. <https://doi.org/10.1016/j.apergo.2019.05.017>