Low Velocity Gunshot Wounds Result in Significant Contamination Regardless of Ballistic Characteristics

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Introduction
- Gunshot wound (GSW) trauma of the extremities is common in many urban settings
- Projectiles that act as foreign bodies following GSW's lead to gross contamination of wounds (Fig 1)
- No consistent treatment algorithm exists for treatment of low energy GSW trauma.
- The purpose of this study was to critically examine the wound contamination following low velocity based upon:
  - common bullet caliber
  - clothing fiber type found within the bullet cavity and the injury track

Objective

• To evaluate the level of gross contamination following gunshot wounds to the extremities

Results
- Regardless of bullet caliber there was gross contamination of the entire bullet track in 100% of specimens in all scenarios and for all fiber types (Figs 4-6)
- Full metal jacket (FMJ) bullet casing did not alter degree of contamination (Fig 7)
- The degree of contamination appeared to increase as the size of the bullet increased

Discussion
- Low velocity GSW result in significant contamination regardless of bullet caliber and jacket type.
- Further investigation of low velocity GSW tracks is warranted.
- Further clinical investigation should focus on the degree to which debridement should be taken.

Summary
- It appears that GSW’s with or without fracture are contaminated by debris such as clothing in all distances regardless of bullet caliber
- Consideration for formal debridement of these wounds should be given in addition to standard antibiotic protocols

Fig 1. Clothing matter removed from wound follow operative debridement of GSW fracture

Fig 2. Two cm piece of denim dragged into the gel after shot with .38mm bullet

Fig 3. Photograph of 13mm diameter ballistics gel with circumferential denim on shooting stand

Fig 4. Two separate gels shot with .22 caliber bullets cut in half along projectile pathway demonstrating gross contamination with denim and wool.

Fig 5. Gel shot with 38 caliber bullet demonstrating large collection of wool bunched at the exit wound and a wide dispersal of individual fibers at the entrance wound.

Fig 6. Gel shot with 9mm FMJ demonstrating gross contamination with denim along bullet pathway.

Fig 7. Four types of bullets that were shot through ballistic gels with denim material only covering the entrance wound. The bullets were stopped by Kevlar bulletproof vests. All bullets contained had retained denim fibers.

First row: Three 9mm FMJ
Second row: Three .45 caliber
Third row: 45mm black talon
Fourth row: three 45mm hollow point

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