Bulletproof Silk: Observations of Dr George E. Goodfellow, the Gunfighter’s Surgeon

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In July 2016, Kraig Biocraft Laboratories, a leading developer of silk-based fibers, was awarded a contract from the US Department of Defense to develop protective apparel for the US Army. Ballistic shoot packs will be constructed from proprietary, genetically engineered spider silk produced by domesticated silkworms. Natural spider silk fibers have tensile strength near to that of Kevlar (DuPont), but with less weight and more flexibility, so the prospect of genetically engineered silks as potential ballistic protection is highly anticipated. Surprisingly, the potential for silk use as ballistic body armor is first documented in the 1880s.

Silk and Gunshot Wounds: A Brief History

Dr George Emory Goodfellow (1855-1910) was a physician in the American Old West and was known as the “gunfighter’s surgeon.” He practiced in the town of Tombstone, Arizona, and was associated with lawman Wyatt Earp, as well as outlaw cowboys Curly Bill Brocius and Johnny Ringo. Given this environment, it is not surprising that he accumulated “a somewhat extensive experience in the gunshot wounds of civil life.” Dr Goodfellow also participated in autopsies of those killed in the infamous Gunfight at the OK Corral, immortalized in several classic Hollywood Westerns such as Tombstone and Gunfight at the O.K. Corral.

Dr Goodfellow is credited with being the first physician to perform a laparotomy to treat an abdominal gunshot wound. Having published multiple articles in medical journals on this particular trauma, Dr Goodfellow became the leading authority on gunshot wounds and is widely considered the first civilian trauma surgeon.

In one particular case report published in 1887, titled “The Impenetrability of Silk to Bullets,” Dr Goodfellow documented the “tenacity of silk fiber and its resistance to the penetrative power of a bullet.” The first patient was a victim dressed in a “light summer suit” that was shot through the heart and found to have a silk handkerchief protruding from the wound. Upon removing the handkerchief, the bullet was recovered. Dr Goodfellow concluded the silk was drawn into the chest by the bullet fired from a Colt 45-caliber revolver, but more importantly, the handkerchief was not perforated by the force of the shot even though it had passed through vertebrae.

The second patient suffered a shotgun blast from a distance of 30 feet that penetrated his skull and chest wall, while his silk handkerchief worn around his neck caught 2 buckshots and prevented direct contact with his skin. Dr Goodfellow observed that one buckshot had penetrated the victim’s thick hat, which was heavily embroidered with silver, and the other buckshot passed through 2 heavy wool shirts, a vest, and a coat. Dr Goodfellow was astounded that the buckshots could be stopped by just a few layers of light silk.

The third patient was shot through the neck at close range from a Colt 45-caliber revolver. Dr Goodfellow attributed the patient’s survival to the loosely tied silk handkerchief around his neck. The entrance wound was so severe it had exposed his right carotid artery, and any liquids he drank flowed out of the wound for several weeks into his recovery. However, once again the silk was drawn into the wound but was uncut by the bullet.

Power of Observation

While his publications captured the mystique of the Wild West like a Western dime novel with a personal tincture of dark humor, Dr Goodfellow was an accomplished researcher and physician in the fields of surgery, urology, and anesthesia. His colorful accounts of silk handkerchiefs and gunfights are not only fascinating but still relevant to saving lives well over a century later.

As an osteopathic medical student, I aspire to make impactful observations of my own. With to-
day’s gun violence representing a major public health issue, it is important that we as future physicians use our education to improve the safety of all those in our communities. Unbiased, unpoliticized, evidence-based research related to gun safety would be beneficial. I may not become the next gunfighter’s surgeon, but as an osteopathic physician, I will be cognizant enough to observe the lessons of our past, present, and future to enhance the health care of our communities. (doi:10.7556/jaoa.2016.147)

References


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