

CASE REPORT

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Pseudo-Stab Wounds: Putrefactive Dehiscence of Remote Surgical Incisions Masquerading as Stab Wounds

ABSTRACT: Artifacts due to decomposition can be mistaken for antemortem injury leading to an incorrect suspicion of foul play. We describe an instance of postmortem wound dehiscence that mimicked antemortem stab wounds. A man with a history of colon cancer and substance abuse was found dead. There were advanced putrefactive changes and multiple defects of the anterior torso that resembled stab wounds. Subsequent investigation revealed that 11 months earlier, he had a laparoscopic-assisted colon resection that involved surgical incisions corresponding in location and size to the above defects. Putrefactive gases may cause bloating of the body. This distension may cause recent and remote healed incisions to dehisce. Correlation of these “defects” at autopsy with the antemortem clinical history is crucial in determining their etiology.

KEYWORDS: forensic science, forensic pathology, putrefaction, decomposition, stab wounds, artifact, dehiscence

Decomposition can mask as well as produce apparent injuries or disease processes. The two major types of decomposition are autolysis and putrefaction. Autolysis is sterile self-digestion and is exemplified by the postmortem changes in the pancreas that are accelerated by its concentration of digestive enzymes. Putrefaction is a microorganism-driven process which typically arises from the normal bacterial flora of the large intestine and skin.

Autolysis and putrefaction can cause postmortem changes that can be misinterpreted as disease or injury (1). Decompositional gases including methane, hydrogen sulfide, carbon dioxide, and hydrogen cause various artifacts (2). These include: bloating (mistaken for traumatic swelling), diaphragmatic hernia formation, purge (mistaken for antemortem bleeding), subcutaneous emphysema (mistaken for pneumothorax), and pseudoligature furrows caused by postmortem bloating with constriction by clothing around the neck (1,3–5).

We describe a postmortem artifact that may be mistaken for an acute premortem sharp injury. This artifact has been previously reported in deaths that occur within 6 months of the surgery (6,7). We report an instance that occurred 11 months after the surgical procedures.

Materials and Methods

The New York City Office of Chief Medical Examiner (NYC OCME) investigates all unexpected, violent, and suspicious deaths in New York City. By statute, these deaths must be reported to the OCME. We reviewed the medical examiner record of a decedent which included the autopsy, toxicology, microscopy, neuropathology, police, and investigator’s reports.

Reported deaths initially are investigated by OCME medicolegal investigators (MLI). The majority of these investigators are

physician assistants; the remaining are physicians. They determine whether a decedent should be brought to the OCME for further evaluation or if the decedent may be released to the funeral home with death certification by the primary care physician. If a death occurs outside of a hospital, they visit the scene and examine the body. The MLI produces a report, describing the medical history and circumstances. The medical examiner examines these reports, including scene photographs and hospital reports, in order to determine if an autopsy is warranted. Bodies that have undergone moderate to marked decomposition routinely are brought to the OCME for further examination and identification.

History

A 53-year-old Hispanic man was found dead in his locked apartment. He had a history of colon cancer, bipolar disorder, and poly-substance abuse. He was last seen 5 days earlier by other tenants of the house who described him as appearing intoxicated.

The building superintendent used forcible entry to access the basement studio apartment because the resident had not been seen recently and there was a foul odor emanating from the apartment. The decedent was found naked on the floor of his apartment in a forward kneeling position, his head resting on a pillow. There were multiple defects of the anterior torso noted by the medicolegal investigator during the scene examination. There were numerous empty beer bottles and hypodermic needles in the bathroom garbage can. There was advanced putrefactive change characterized by purged blood, diffuse green skin discoloration, skin slippage, bloating, and a foul odor; flies, eggs, and maggots of varying sizes were seen on the body. There was a marked amount on blood/bloody purge under and around the decedent, as well as more distant from his body. Medications included iron supplements, sertraline, ranitidine, and levalbuterol. The crime scene unit was summoned based primarily upon the defects on the body and the associated volume and pattern of blood.

At autopsy, the decedent measured 5’6” and weighed 117 lbs. There were three skin defects of the anterior abdomen located in

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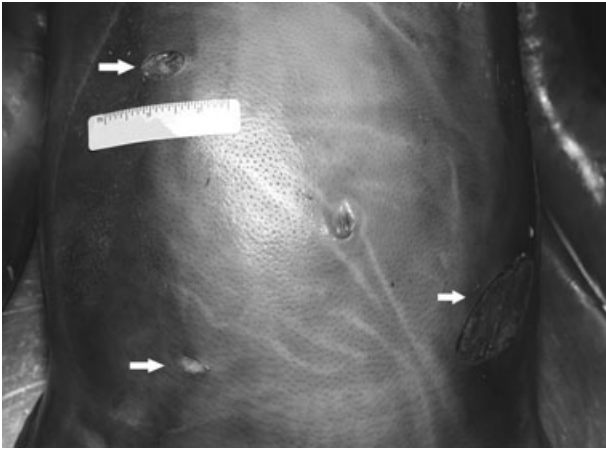


FIG. 1—Surgical wounds of abdomen (arrows).

the right upper (1-1/8", horizontal) and lower (1/2", horizontal/oblique) and left lower (3-1/2", oblique) quadrants (Fig. 1). There were no associated injuries of the viscera, no subjacent soft tissue hemorrhage/wound tracks, and no hemoperitoneum. The morphology of these skin defects resembled that of a stab wound (i.e., narrow, roughly oval-shaped). There was a gaping, 1-1/2" horizontal defect of the right midclavicular region with a portacatheter protruding from it (Fig. 2). There was no head or neck injury.

Subsequent investigation revealed that 11 months earlier, the decedent had a laparoscopic-assisted sigmoid colon resection for an invasive adenocarcinoma discovered during a screening colonoscopy. The surgery included a 5 mm laparoscopic port inserted in the right lower abdominal quadrant and a 10 mm port in the right upper quadrant. An oblique, 5 cm incision of the left lower quadrant of the abdomen was performed to mobilize and exteriorize the sigmoid colon. The sizes of these surgical incisions roughly corresponded to those of the defects found at autopsy. Surgical pathologic examination of the sigmoid colon revealed a polypoid, 0.9 cm invasive adenocarcinoma with a single positive regional lymph node (one of eight). A right internal jugular portacatheter was placed for chemotherapy *c.* 3 weeks after surgery. He underwent nine cycles of chemotherapy (FOLFOX4: oxaliplatin, leucovorin, and 5-fluorouracil) over the next 6 months. His last cycle of chemotherapy was 3 months prior to death.

At autopsy, there was no local recurrence of cancer or metastases, and there was no intravascular or body cavity blood retrievable for toxicologic specimens. Toxicologic analysis of brain detected



FIG. 2—Surgical wounds of chest (with protruding portacatheter) and right upper quadrant of abdomen (arrows).

morphine (0.30 mg/kg), benzoylecgonine (0.71 mg/kg), and ethanol (0.13 gm %). The decedent never had been prescribed morphine for the treatment of cancer-related pain (his cancer was clinically in remission). The cause of death was certified as acute opiate intoxication; the manner was an accident (substance abuse).

Ultimately, the autopsy and clinical and scene investigations supported this opinion, despite the initial justifiable concerns by the investigator and law enforcement personnel. With hindsight, even the decedent's position (prone kneeling, head on pillow) was consistent with an opiate death.

Discussion

We describe a decedent with advanced putrefaction that initially was investigated as a homicide due to apparent stab wounds of the torso (Fig. 1) and the large amount of blood around and distant from the body. The absence of vital injury at autopsy, a history of colon cancer, and the locations of the injuries resulted in further investigation that elucidated the history of prior surgery. After discussion with the surgeon and review of the medical records, the four skin injuries of the torso were determined to be remote surgical incisions (portacatheter placement and laparoscopic-assisted sigmoid resection). The surgery occurred *c.* 11 months before death. One would have expected these injuries to have completely healed, but a relative weakness in these locations allowed the expanding putrefactive gases to cause "dehiscence" of the surgical incisions.

Findings that differentiate this phenomenon from antemortem stab wounds include the location of the wounds, detection of surgical sutures, protrusion of underlying implanted devices, and the absence of a corresponding wound track and/or visceral injury. Therefore, a careful review of the prior medical and surgical history is essential. Recognition of these defects as remote surgical incisions also can assist with subsequent identification of the decedent (7).

In certain instances, hemorrhage associated with wounds may assist in determining whether an injury occurred before or after death. With marked putrefaction, however, one must be particularly careful about interpreting the presence or absence of hemorrhage. The absence of blood in a wound track in a markedly putrefied body should not be considered proof that the injury occurred after death. Autolysis and bacteria can degrade red blood cells and maggots can ingest blood and tissue, particularly in areas of recent injury (3). In such instances, another important finding includes convincing soft tissue and/or visceral defects subjacent to the cutaneous defects, explicable only by penetrating trauma.

The distribution and large volume of putrefactive fluid at the scene appeared to be insufficiently explained by purged decompositional fluid. The mechanism of death, however, may contribute to the extent of purge. Adelson noted that if a death were preceded or accompanied by hemorrhagic pulmonary edema, a liter or more of bloody fluid may be expelled when intrathoracic gas accumulation has built up sufficient pressure (8). Pulmonary edema is a common finding with acute opiate intoxication deaths.

In addition to purge, bloody decompositional fluid also may accumulate in the chest and abdominal cavities (3). This fluid, normally contained by intact skin, likely escaped through the chest and abdominal defects after death, further confounding the impression of antemortem bleeding. Postmortem seepage from the "dehiscenced" surgical incisions is supported by the virtual absence of body cavity fluid at autopsy. Moreover, the blood found more distant from the body at the scene was contiguous with that found around the body, and could easily be explained by even a minor canting of the floor away from the body.

Cutaneous wound healing by first intention is the least complicated type of wound repair, involving clean, uninfected, surgical incisions approximated by surgical sutures (9). The stages of healing sequentially include inflammation, granulation tissue formation with re-epithelialization, and wound contraction. Most surgical wounds are fully healed within 6 weeks. Skin incisions will heal solidly within 2–3 weeks, while abdominal fascia will be reasonably secure within 6 weeks and continue to gain strength for at least 6 months (10). Tensile strength of the wound will continue to increase and it may take several months for the wound to obtain its maximal strength (9).

Various factors may predispose to poor healing and postsurgical wound dehiscence in the living patient (11). These include poor nutrition, the use of steroids or cytotoxic drugs (e.g., methotrexate, 5-fluorouracil, and cyclophosphamide), and sepsis (10). The incidence of abdominal wound dehiscence is approximately one in every 500 surgical operations. Additional risk factors for dehiscence include abdominal distention, chronic cough, obesity, old age, and wound infection. Our patient received chemotherapy. “Dehiscence” in the postmortem setting invites a host of variables not applicable to the living surgical patient, but a decedent’s antemortem degree of morbidity may predispose to a greater or lesser likelihood of putrefaction-mediated dehiscence. The poorer the wound healing prior to death, the more likely one would expect postmortem dehiscence. Gravitational forces associated with postmortem body position also might play a role.

Putrefactive gaseous distension may cause a previously healed wound to dehiscence during the postmortem interval. This postmortem artifact may create the mistaken appearance of an antemortem sharp injury which may erroneously lead to a suspicion of foul play. An autopsy and review of the medical history usually allows differentiation of a fatal stab wound from a postmortem artifact.

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