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Clinical Cases from the Practice of Members of the Surgical Infectious Society of North America (SIS-NA)

A.O. Okhunov¹

ABSTRACT

This description provides publicly available information regarding interesting clinical cases that have been borrowed from the descriptions of members of the SIS. We intend to present these cases with descriptions, as we believe that they will be very useful and interesting for subscribers of our scientific and practical journal. So, we present a description of the following three interesting clinical cases:

1. *Extensive Bilateral Gluteal Necrotizing Myositis after International Cosmetic Tourism* (Robel Beyene MD, Jeffrey Shupp MD, Anthony Shiflett MD, Chadi Abouassaly MD);
2. *An improvised adaptation of negative pressure wound therapy in Nicaragua for the management of intraabdominal sepsis* (Roberto J. Silva Doña MD, Hector Nunez, Andrew H. Stephen);
3. *Sweet Syndrome Manifesting as a Case of Necrotizing Soft Fasciitis* (John S. Young MD, Daithi S. Heffernan MD).

The author does not declare any conflict of interest, as we do not intend to claim co-authorship on these publications. They are presented solely for the purpose of disseminating valuable clinical information.

On behalf of the scientific journal, we offer sincere appreciation and gratitude to the educational resource of the SIS-NA.

Keywords: Diabetes mellitus, surgical infection, pathogenesis

INTRODUCTION

Necrotizing myositis is a condition characterized by rapidly advancing, severe infectious necrosis of a muscle group or compartment with acute inflammatory infiltration, pain and tenderness, loss function of the affected muscles, and, if left untreated, septicemia and death [1].

Myositis can be idiopathic, or can be secondary to local trauma, malignancy, or ischemia [2].

While this condition is rare in the United States and other developed nations, it is more common in developing nations and in the tropics [3].

As Americans increasingly look to cost competitive, offshore, and international options for surgical care, they expose themselves to a different risk pro-

¹ Deputy Editor-in-Chief of the journal, e-mail: general-surgery@mail.ru

file in many aspects, including the native microbiome of their host nation [4].

International cosmetic tourism has grown significantly due to the cost savings and accessibility offered in some markets.

As this trend burgeons, patients are returning to their developed nation homes with complications and sequelae from low-cost surgeries done abroad, including various surgical infections. Necrotizing soft tissue infections are among the complications seen with increasing frequency in the United States and other developed nations, after international cosmetic tourism.

Intra-abdominal sepsis is a serious complication after anastomotic leak leading to increased mortality in patients.

The use of negative pressure wound therapy (NPWT) in intra-abdominal infections has been shown to reduce morbidity and mortality compared to the combination of laparotomy, irrigation, and drainage.

In Nicaragua, public hospitals are the main health care providers and due to budget limitations some therapeutic alternatives such as NPWT are not obtainable.

These resource limited settings require providers to improvise and use the materials that are available to care for complex wounds, open abdomens, and intraabdominal infections.

The following case at Hospital Escuela Antonio Lenin Fonseca (HEALF) in Managua, Nicaragua illustrates the creation and use of negative pressure wound therapy using materials readily available in a public state hospital to control intraabdominal sepsis.

Necrotizing fasciitis is a rapidly spreading bacterial infection leading to necrosis of soft tissue and deep fascial involvement.

Prompt surgical debridement with adjunctive supportive care is essential. Sweet's syndrome, also known as acute febrile neutrophilic dermatosis, was first described in 1964 by Robert D. Sweet.

It is characterized by the abrupt onset of tender erythematous skin lesions, diffuse infiltration of neutrophils in the dermis, prodromal symptoms, or risk factors such as an underlying malignant lesion.

It shows a good response to systemically administered steroids and not antibiotics.

Kroshinsky first described Necrotizing Sweet's Syndrome (NSS) in 2012.

NSS is characterized by similar clinical and pathological features as necrotizing fasciitis, but in the absence of an infectious cause.

PRESENTATION # 1

A 44-year-old woman presented with a one-week history of persistent, unbearable pain and tenderness in her bilateral buttocks and right, lower flank. This episode began following abdominoplasty, liposuction of her bilateral thighs, and bilateral gluteal fat injection in the Dominican Republic, one week before presentation. While her abdominal incision had become less painful, her buttocks and flank had become more severe each day after surgery, until the patient was no longer able to ambulate freely.

PMHx: Hypertension, Type II diabetes mellitus.

PSHx: Hysterectomy.

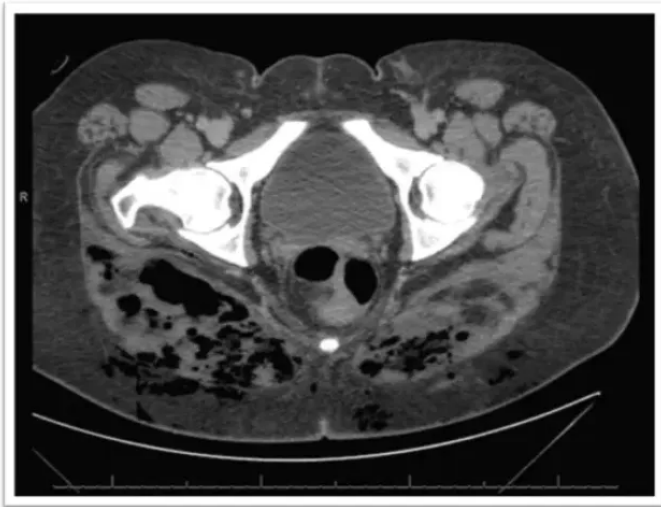
SHx: She denied a history of smoking but did drink occasionally.

PHYSICAL EXAM

On initial exam, the patient was tachycardic to 139, with a blood pressure of 136/62, and a temperature of 37.6°C. She had a well approximated transverse, suprapubic incision with mild serosanguinous drainage. She had no open wounds or erythema of either buttock, but both were very firm and exquisitely tender to any palpation. There was bilateral crepitus.

ASSESSMENT

Lab results showed a leukocytosis of 22.4 thousand/mm³. The patient's sodium was 135 mEq/l and her lactate was 2.2mmol/l. A CT scan was notable for significant air in the deep soft tissue and throughout the musculature of her buttocks, bilaterally, and her lower, right flank. After the ruling out the possibility that the CT findings were normal after gluteal fat injection, the patient was diagnosed with a necrotizing soft tissue infection.



HOSPITAL COURSE

Central venous line, urinary catheter, and broad-spectrum antibiotics were all continued, along with fluid resuscitation. In the operating room, upon incising the fascia overlying the right gluteus maximus, a large volume of foul smelling, necrotic fat was expressed. The incision was broadened, and another incision was made on the contralateral side, exposing large sections of necrotic muscle and fat, including portions of the gluteus maximus, gluteus medius, gluteus minimus, and piriformis, bilaterally. All areas of necrosis were excised or debrided, and a sterile dressing was placed over the wounds. After several return trips to the operating room, along with the reconstructive surgeon, the patient eventually did well enough to be transferred out of the ICU and to the wards with a negative pressure wound therapy device. Her operating room cultures grew few, multi-drug resistant, staphylococcus epidermidis.

RESULTS

The patient had her surgical wounds closed by the reconstructive surgery team and was discharged home on hospital day 10 in stable condition. She continued to follow up with the reconstructive surgeon, who eventually performed and buttock augmentation on her.

PRESENTATION # 2

A 49-year-old man was transferred to HEALF with a report of two days of leakage of intestinal fluid through his surgical wound. Three weeks prior to transfer he underwent subtotal gastrectomy and Roux-en-Y gastrojejunal anastomosis for a malignant distal gastric outlet obstruction. One week after this operation he developed a duodenal stump leak. The duodenal stump was re-sutured, and a closed suction drain was placed near the stump.

Past Medical History - poorly differentiated diffuse type gastric adenocarcinoma, stage IB: T2a, N0, M0 (2).

Past Surgical History: none prior to these most recent operations.

Social History: lives at home, no history of alcohol or tobacco use.

PHYSICAL EXAM

On arrival to HEALF: Patient appeared unwell with decreased skin turgor and dry mucous membranes, scleral icterus. Temperature 39.6C, heart rate 110 bpm, BP 70/50 mmHg, respiratory rate 30 bpm. His initial CVP was 0mmHg. He also displayed mild abdominal distension with tenderness and green intestinal fluid output through the surgical wound.

LABS/IMAGING

WBC 16,000/mm³ (88.4% Neutrophils)

Sodium 133meq/L

Creatinine 0.5mg/dL

Lactate, bilirubin, liver enzymes and cultures were not available at the hospital's laboratory.

Abdominal ultrasound showed fluid collections throughout the abdominal cavity.

ASSESSMENT AND PLAN

Patient was diagnosed with sepsis of intra-abdominal origin causing fluid sequestration and significant intravascular fluid deficit.

HOSPITAL COURSE

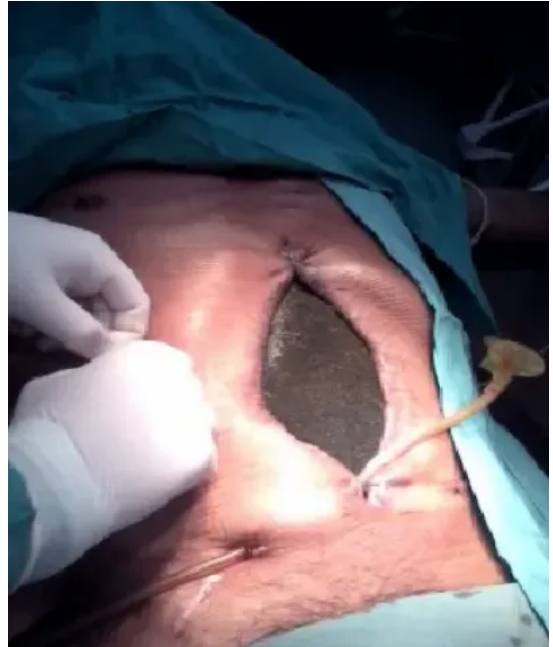
Blood pressure was successfully normalized after goal-oriented fluid resuscitation to a CVP of 8-12 mmHg and broad-spectrum antibiotics were initialized. After the patient was stabilized, he was taken to the operating room for to establish source control of intraabdominal sepsis. A 300ml purulent collection in the pelvic cavity and intense visceral adhesions were found. The intra-abdominal viscera were fused and did not allow clear anatomic planes for dissection such that the source of the leakage was not identified in this initial surgery. Abdominal lavage was carried out and closed suction drains were placed before skin closure.

In the first 24 hours postoperatively large amounts of intestinal fluid output were observed through the surgical wound and drains. The patient was taken to the OR on hospital day two and a dehiscence in the gastrojejunal anastomosis was identified. The dehiscence was managed by placement of a 32 Fr Foley catheter and its balloon was filled with 20 ml of water. The opposite end of the catheter was percutaneously exteriorized through the right flank making this a gastrostomy tube. The abdomen could not be closed due to hollow visceral distension. One commercial negative pressure wound therapy kit was available having been given by a private donation a few weeks earlier. It was placed to contain and control intraabdominal fluid and any ongoing leakage from the failed anastomosis.

The NPWT was connected to a suction device providing 80 mmHg of negative pressure and the drainage gastrostomy was connected to a collection bag. The next day's lab results showed a noticeable decrease in leukocytes (9,900/mm³, 77% neutrophils) and the patient no longer had fevers.

Three days later the NPWT needed replacement and no commercially designed kits for NPWT were available. An emulation with the available hospital materials was improvised. First, an extended IV bag with fenestrations was placed over the viscera (interface layer) then sterile cotton gauze pads were placed above this but within the wound. For suction tubing, two 32 French Foley catheters were placed

in the gauze pads and exteriorized percutaneously. Finally, a self-adherent sterile polyethylene film was placed in a two-layer fashion. The first layer covered the surgical wound, and the second layer covered the entire abdomen, thus creating a complete seal.



Although the intra-abdominal sepsis and anastomotic leak were controlled, the patient developed

intolerance to oral intake and signs of intestinal obstruction possibly secondary to the intense visceral adhesions. Parenteral nutrition was not available at the hospital. The improvised NPWT was functional and there were multiple signs that the intraabdominal sepsis was controlled. Lab results showed normal leukocyte level levels and the patient was without fevers. Four days later, the improvised NPWT was replaced using the same procedure. The next day the patient decided to refuse further healthcare and abandoned the hospital.



PRESENTATION # 3

A 44-year-old woman presented with a history of recurrent breast abscesses over several months. Her ED visit was prompted by an acute worsening of the pain and increase in size of the abscess prompt.

PMHx: GERD, obesity (BMI = 39).

PSHx: Excision and grafting bilateral axilla for HS.

SHx: 0.5 ppd tobacco, significant socioeconomic hardship – no heat and no running water for bathing.

PHYSICAL EXAM

Pendulous breasts with bilateral scar tissue in the submammary and inframmary folds (IMF). Skin of the IMF was damp and macerated. The right breast had a sinus tract draining frank pus with a large area of fluctuance.

ASSESSMENT

Acute worsening of her hidradenitis given her large, pendulous breast which was only exacerbated by lack of personal hygiene with loss of access to bathing.

HOSPITAL COURSE

Incision and drainage x 2 was performed in the ED for a large amount of purulent drainage from the right breast. This was packed and the patient was admitted for wound care and further management. Meticulous wound care and personal hygiene are the mainstay of therapy. Incision and drainage when infected can be useful, however, over time inflammation and scarring result in thickened and contracted skin with nodules. While admitted the patients' wounds and pain improved and she tolerated packing changes. Social work coordinated access to heated water for medical necessity.



RESULTS

The patient was discharged to home on hospital day 3 for continued wound care and hygiene particularly in the IMF and submammary region. She continued her outpatient minocycline which she had been on chronically.

DISCUSSION

The very nature of international cosmetic tourism makes it difficult to calculate the potential risks and benefits [5].

The cost savings and accessibility make it both attractive to the consumer and laudable in its own right; however, these benefits may come at the cost of appropriate pre-surgical evaluation, post-surgical

management, patient safety, and the oversight, accountability, and record keeping supporting those tenets of surgery commonly seen in developed nations [6].

Furthermore, as complications arise, patients are either turned away from or lose faith in these low-cost options and return to their developed nation homes for care, with little hope of reaching their surgeon abroad for information or records to aid in their care [7].

In a survey of Canadian physicians, 41% of the physicians who had encountered such patients responded that patients presented with insufficient information about their treatment abroad [8].

A survey of US medical tourism companies found that 91% of the companies gathered patient satisfaction data, while only 50% collected patient outcome data [6].

In developed nations, this data is routinely collected, and complications are commonly taken back to the operating surgeon responsible.

Almost every published study on international cosmetic tourism lists cost savings as the primary driver of the industry. Arguments have been made those outsourcing certain procedures to low cost, international hospitals could save billions of dollars from the US budget and defray Medicare spending [9].

These calculations, however, assume equipoise between all care facilities. As patients are more likely to have complications treated in their native countries, those developed nations essentially underwrite procedures done abroad by guaranteeing emergency care to its citizens. This suggests that, while the unit cost of cosmetic tourism may be lower, the societal cost may not be. A small UK study by Miyagi et al. showed that hospitals treating these patients did so at a financial loss, while Hanefeld et al. calculated cost of £ 8.2million per year for all such patients in the UK [10, 11].

The most common complications following international cosmetic tourism are infectious complications, which will likely continue to increase as cosmetic tourism grows in popularity. This is partially driven by high background rates of certain infections, such as tuberculosis, Hepatitis B and C,

and HIV, in some tropical and subtropical cosmetic tourism destinations [5].

This, along with variations in drug resistance profiles and questionable sterile practices, leads to increased risk of infection. It is the responsibility of American surgeons to understand the needs, and unique risks of these patients, as well as the systemic driving forces and repercussions of international cosmetic tourism.

High morbidity and mortality rates, 39% and 31% respectively, have been reported when gastrojejunostomy is required for malignant gastric outlet obstruction [12-15].

This case highlights some of the early complications of a difficult foregut operation in a patient with malignancy [16-24].

A high output anastomotic leak and presence of uncontrolled intra-abdominal sepsis requires emergent exploration [25-33].

In a public hospital with limited resources however the challenge has just begun managing a patient with intraabdominal sepsis and an open abdomen.

A recent systematic review describes that NPWT appears to be the most suitable temporary abdominal closure method currently available in the septic or contaminated abdomen. This method has been associated with the highest fascial closure rates. Improved outcomes were demonstrated with the use of commercial systems as opposed to vac-pack dressings using surgical towels as wound fillers. There are no publications regarding the use of gauze as wound filler in NPWT for temporary abdominal closure. Another important outcome to consider in these cases is incidence of new enterocutaneous or enteroatmospheric fistulas. Time to fascial or skin graft coverage of the abdomen has been shown to be related to fistula development rate. One can assume that devices, whether commercial or homemade, that control fluid output, intraabdominal sepsis and promote granulation may reduce development of fistulas. This becomes an even more important concept in resource limited settings such as this as access to parenteral nutrition as mentioned above is usually not possible [34-43].

The resource limitations in public state hospitals of developing countries considerably decrease the therapeutic alternatives in complex and complicated surgical patients.

The medical uncertainty is not just what the ideal treatment of choice is, but what treatments are available at the time being. Such difficulties led to the application of an improvised emulation of NPWT. Even though a complete resolution of the patient's morbidities was not carried out, a functional NPWT system with easily and regularly obtainable materials of low cost that successfully controlled intra-abdominal fluids and sepsis was achieved.

This provided a therapeutic option that was previously unavailable in our healthcare environment. Efforts should continue to be made to develop and improve on these types of devices such that the knowledge and techniques can be brought to other limited resource settings.

Breast involvement in HS is relatively rare though reported.

Any hair bearing skin is at risk of developing HS in those with a history. Our patients course speaks to the importance of meticulous personal hygiene in the intertiginous regions to minimize risk of infection and abscess formation. Surgical management can often time include excision and grafting in severe cases. However, given the nature of our patient's presentation and her large breasts we advocate for bilateral reduction mammoplasty once local wound care is achieved for ease of personal hygiene and to reduce the skin-skin redundancy seen in females with pendulous breasts.

All publications and photo documents submitted to them were borrowed from the SIS-NA open access website.

Conflict of interest - the author does not declare any conflict of interest, as we do not intend to claim co-authorship on these publications. They are presented solely for the purpose of disseminating valuable clinical information.

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