

Comprehensive Clinical Scenario – Wound

Chief Complaint:

A sixty-eight year old Caucasian female presents in primary care clinic. Patient reports she broke her ankle in 2 places about 3 weeks ago and she began sleeping with a heating pad on her left ankle/foot all night. One week ago she noted a burn wound to her left 5th toe. Three days ago she noted two wounds on the left outer ankle and left outer mid-foot she believes to be caused from the burn. She reports increased swelling over the past 3 days and generalized throbbing pain with a deeper pain in the left posterior calf, pain is worse when the foot is in a dependent position and with walking.

History of Present Illness:

1. Three weeks prior patient sustained a fall resulting in a left lateral malleolus and talus fracture– treatment with AirCast walking boot worn 22 hours each day removed for bathing and range of motion exercise – managed by orthopedic surgeon
2. Left ankle pain and swelling treated by patient with elevation and ice during the day and heating pad at night Pain medication – Ibuprofen 800 mg every am and Two Tylenol #3 tablets at HS
3. All 3 wounds are covered with dry gauze and tape
4. Last Tetanus Toxoid – 4 years ago
5. Last antibiotic >6months ago

Past Medical History:

1. Type II Diabetes Mellitus, age of onset: 51 year-old, last HgA1c 7.1
2. Breast Cancer – age 53 lumpectomy, chemo/radiation
3. Peripheral neuropathy
4. HTN – controlled with Lisinopril 40 mg and 12.5 mg Hydrochlorothiazide
5. Hypothyroid – 25 mcg Synthroid
6. Osteoarthritis – diagnosed at age sixty-one (right knee and bilateral hip joints)
7. Obese (wgt 178 lbs, hgt 5’ 2”)

Current Medications

1. Ibuprofen 800 mg once daily in the am started three weeks ago after ankle fracture – decreases pain to tolerable level
2. Tylenol #3 Tablet two tabs at bedtime – reduces the pain and makes her sleepy so that patient can rest at night
3. Lisinopril 40 mg and 12.5 mg Hydrochlorothiazide one combined tab daily in am
4. Synthroid 25 mcg one tab daily upon rising at least 1 hour before breakfast
5. Multivitamin with iron one tablet once daily at bedtime
6. Glucosamine and Chondroitin – cannot recall dose, takes two tabs twice daily
7. Metamucil – once daily at bedtime

Pertinent Family and Social History

1. Husband – deceased 2005
2. Father died at age 71 CAD, HTN
3. Mother died at 62 metastatic breast cancer; Type II Diabetes Mellitus
4. two daughters and one son – alive and well, live out of state

5. Patient lives alone, works part-time as a CPA, does not drive uses public transportation, active in church and sorority. Have friends who help her with meals and grocery shopping since her injury.
6. Denies alcohol or tobacco use

Allergies:

1. Sulfa compounds – reaction: severe hives and pruritis

Pertinent Review of Systems:

1. Neurologic : no numbness, tingling or burning sensation in LLE
2. Cardio: No fatigue, shortness of breath, chest pain or pressure
3. Resp: no cough or difficulty breathing
4. GI no nausea, vomiting, or change in appetite
5. GU no burning or itching
6. Skin no rashes
7. BLE Vascular assessment: no history of LE swelling or wounds, no prior history of pain with walking or at rest

Comprehensive Problem Focused Physical Exam:

Vital Signs: BP 142/88 P 82 R 14 T 99.6 wgt 168 lbs hgt 5' 2"

General: Well developed and well groomed. Alert and oriented to person place and time, moves all extremities, cooperative with examination, asking appropriate questions

Bilateral Lower extremity

Pulses equal (+2) and strong DP and AP, Cap refill < 3 sec, color normal for race, cool to touch, no hair growth, 10 gram monofilament testing: LLE 3/10 and RLE 7/10

LLE Midcalf to toes non-pitting 3+ edema, erythematous, tender to touch and with movement, posterior calf pain with palpation, unable to assess homan's sign due to generalized pain associated with ankle fracture and limited range of motion in ankle

1. Wound One – Left foot 5th digit – located over the anterior – lateral – posterior portion of the toe and extending to the 5th metatarsal head - total affected area measures 6.3 cm x 3.8 cm and is warm to touch when compared with adjacent tissue and painful to touch. Wound is covered 100% with tan leathery necrotic tissue and area measures 5.3 cm x 3.1 cm x 0.0 cm. Peri-wound tissue is erythematous, edematous, indurated, proximal portion of total affected area is covered by loose skin that appears to have been a fluid filled blister that has spontaneously unroofed (measures 1.0 cm x 3.8 cm) Periwound area is non-blanchable and non-tender white colored thickened skin tissue. Posterior ¼ of wound is tender to touch and slow to blanch
2. Wound Two – Left Lateral Malleolus – wound is covered 100% with moist yellow slough and measures 2.6 cm x 1.9 cm x 0.3 cm. Wound margins are well demarcated. Periwound tissue is normal for race and color, No undermining, tunneling, drainage, odor, erythema, edema, or induration noted.
3. Wound Three – Left mid-forefoot - wound is covered 100% with dry yellow slough and measures 2.0 cm x 1.1 cm x 0.2 cm. Wound margins are well demarcated. Periwound

tissue is normal for race and color, No undermining, tunneling, drainage, odor, erythema, edema, or induration noted.

Diagnostic Testing/Evaluation:

- Venous Duplex Scan to r/o Deep Vein Thrombosis
- Compartment Pressure Measuring
- Pulse Oximetry – can quickly identify oxygen perfusion to LLE
- High frequency ultrasound – determine depth of tissue damage
- LLE 5th digit burn wound – wound culture and sensitivity
- X-ray left foot/ankle – anterior- posterior, lateral, and mortise views
- LAB – CBC, Electrolytes, Pre-albumin, Total Protein, Glucose, HgA1c

Differential Diagnoses:

1. Wound One – Left foot 5th digit Toe – full thickness burn with evidence of cellulitis - source thermal injury from heating pad
2. Wound Two – Left Lateral Malleolus and Wound Three – Left mid-forefoot
 - a. pressure ulcer secondary to LLE edema and AirCast walking boot
 - b. Compartment Syndrome – report of pain, ischemic ulcers, AirCast boot, fracture
 - c. Co-morbidities which may have caused or contributed to ulcer formation
 - i. Diabetic neuropathy with loss of protective sensation LLE > RLE
 - ii. Arterial Ulcer – arterial insufficiency

Plan of Care:

1. Additional testing to consider
 - a. LLE Arterial Duplex Exam – determine circulatory status of LLE
2. Consultations and referrals with reason and outcome (if available)
 - a. General Surgeon sharp surgical debridement – LLE 5th digit Discussed Wound One – left foot 5th digit – full thickness burn. Discussed plan with collaborating physician and decision was made to refer to general surgery for sharp surgical debridement rather than burn surgeon due to the age of the burn injury (> 7 days).
 - b. Orthopedic Surgeon re-evaluate LLE ankle fracture management including casting/splinting vs AirCast boot
3. Evidence based therapeutic interventions
 - a. Wound One – leave open to air until consult general surgeon
 - b. Wound two and three - Cleanse each wound with 5-10 cc TechniCare Scrub using a gentle 2 minute scrub technique then thoroughly rinse with normal saline. Apply nickel thick layer of collagenase (Santyl) ointment, pack and fill dead space with dry gauze, cover with dry gauze, secure in place with surginet, do not use tape directly on friable edematous periwound tissue. Cleanse wound and change dressing once daily and PRN for heavy exudates or soiling
4. Discharge planning for transfer to next level of care
 - a. admit to hospital
 - b. IV antibiotics (Vancomycin)
 - c. Sharp surgical debridement of LLE wounds
 - d. Bed rest until Duplex Scan completed to r/o DVT
 - e. elevate and ice LLE
 - f. Do not wear AirCast

5. Expected outcomes and measurement criteria
 - a. Manage pain and reduce swelling
 - b. Treat cellulitis and prevent osteomyelitis
 - c. Debride wounds (1, 2, 3)
 - d. Prevent further skin breakdown related to AirCast
 - e. Splint ankle and promote healing of fractured bones
6. Advocacy
 - a. Heating Pad injuries are reportable to the FDA under the MedWatch Program for post market surveillance and patient safety
7. Anticipatory guidance and teaching:
 - a. Instruct patient that heating pads should only be used while awake and for short periods of time
 - b. Ice will be more effective in relieving pain
 - c. Instruct on elevation of LLE to reduce swelling
 - d. Instruct on how pressure ulcers form and how to check LLE for signs of pressure ulcer formation related to AirCast walking boot or other type of splinting device
 - e. Instruct on wound dressing changes

Evaluation of the plan of care

LLE 5th Metatarsal head burn wound – healed with preservation of joint
Wounds two and three – healed without further complications
Ankle fracture healed with full range of motion in joint and ambulatory

Pertinent References

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