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Emergency Medicine Sample Case

Diabetic foot infection mistreated resulting in gas gangrene and leg amputation.

The patient was 56 years old at the time he presented to the Hospital on August 4 complaining of left foot swelling that evolved over four to five days with a painful blister on top of his foot. At the time of this presentation to the Emergency Ward, it was well established that the patient had been a noninsulin-dependent diabetic for decades. The history was also obtained that the blister had been present for more than a month and had become increasingly painful to the point where he was unable to bear weight on his left foot. The patient denied preceding trauma.

The medical records are clear that the patient underwent blister drainage following a supposedly normal x-ray of the left foot. The blister drainage procedure was performed by Dr. #1 and revealed 1-2 cc of bloody fluid in the absence of pus. Of note, this fluid was not submitted for culture or gram stain analysis, which would have been the appropriate standard of care to perform in a diabetic when infection has not been excluded. A gram stain is a rapid microscopic analysis that can be invaluable at pinpointing infection and defining the bacterial type of infection involved so that appropriate antibiotic therapy can be begun.

The patient, although afebrile (without fever), did not have routine diabetic studies performed, nor was a CBC, a basic blood test to help exclude infection, obtained.

It can be stated, within a reasonable degree of medical certainty, that the standard of care when a diabetic patient presents with an unexplained, painful foot blister, is to assume the blister is infected until proven otherwise. Although the role for drainage of such blisters is controversial, once the blister is drained, it is imperative that the fluid be analyzed to rule out infection. In fact, the presence of bloody fluid in the absence of pus is typical of

infection with bacteria of a less pyrogenic (pus-producing) nature. These bacteria are not uncommon in diabetics.

In addition, it is well established that diabetics can have smoldering, low-grade infections and they often have atypical presentations of these infections.

It is also well established that diabetic foot infections are a major cause of potential limb loss as well as serious complications, especially if undertreated or underappreciated.

Even if infection was not strongly suspected prior to this drainage procedure, it should have been quite apparent to his Emergency Room caretakers that any drainage procedure would predispose this diabetic to further risk of infection due to the introduction of soft-tissue skin breaks. No systemic antibiotic therapy was prescribed for him before, during or after this drainage procedure and no antibiotic or antiseptic topical preparations were applied to the foot wound. It is also unclear as to what type of dressing was applied in this setting.

The patient was discharged from the Emergency Room with a diagnosis of musculoskeletal foot pain. He was prescribed a medication known as indomethacin, which is a nonsteroidal anti-inflammatory agent that can mask fever as well as the classic inflammatory signs and symptoms of infection if and when such infections subsequently develop.

It is also apparent from the Emergency Ward records that an inadequate attempt was made at patient education in terms of what signs or symptoms needed to be watched for. The patient was given, for example, no instructions in terms of what to do should redness or streaking of the foot or increasing pain develop. In short, the discharge instructions that this patient was given were inadequate. His entire Emergency Room work-up fell far short of the standard of care for handling a diabetic foot wound when infection has not been adequately excluded. Similarly, there was not even an attempt made to gauge the effect that this foot process had on the patient's diabetic state since no blood glucose monitoring was performed on this Emergency Ward visit.

Additionally, he was given instructions to seek follow-up with his Primary Care Physician, Dr. #2, on August 17, a nearly two-week delay. This is far longer than is the recommended time frame for follow-up following an incision and drainage procedure from which infection had not been adequately excluded.

Also, the Emergency Ward Physician's preliminary radiographic impression of a normal foot film was erroneous. The official reading of this report was consistent with a neuropathic joint or trauma, which we know this patient did not sustain. In addition,

subchondral erosions that were seen within the joint of the cuboid and fourth metatarsal joints could well have been consistent with osteomyelitis or even septic arthritis, two very serious conditions for a diabetic to experience. The official radiographic interpretation by Dr. #3 was made on August 5 and reverified on August 6 such that the Emergency Ward physician, Dr. #1, had ample time to intervene to have the patient return for further Emergency Ward evaluation.

On August 17, the patient, while going to his follow-up appointment, sustained a fainting episode and was admitted to the hospital, at which time the diagnosis of gas gangrene was made and he promptly underwent a guillotine amputation at the below-the-knee level.

On the date of this hospitalization at the Hospital, the wound size had markedly increased from 1 x 1 cm to 4 x 8 cm, and was actually draining pus and gas. This condition, that of a wet gas gangrene with cellulitis, required urgent operative intervention. I have no qualms with the decision to have the patient undergo a guillotine below-the-knee amputation procedure. He underwent this procedure on August 24, which, although somewhat delayed, nonetheless needed to be done, and this procedure was appropriate.

Although I also have some reservations regarding the use of the antibiotic ampicillin sulbactam, this was not a medically treatable condition and gas gangrene is surgically managed with the choice of antibiotics being less important than the surgical aggressiveness required.

It should also be noted that during this course of hospitalization, he was noted to have kidney dysfunction which was most likely secondary to the combined insults of indomethacin as well as untreated soft-tissue sepsis and a diabetic state.

The condition of gas gangrene is an aggressive diabetic soft-tissue emergency that frequently leads to multisystem failure and a host of other complications, as was seen here, including kidney and cardiac disturbances.

In summary, the Emergency Ward treatment that he received by Dr. #1 on August 4, exhibited numerous deviations from the existing standards of care. These deviations have already been alluded to and include the lack of proper consideration of infection in a diabetic without trauma and with a relatively long-standing foot blister. Other deviations from the standards of care include the incision and drainage of this blister without obtaining proper cultures, gram stain and lab studies, such as a white blood count and kidney function analysis and the incorrect interpretation of the left foot x-ray films. Additionally, Dr. #1 had the opportunity, once the offical x-ray report was finalized, to intervene and get the patient back for an early re-evaluation, but failed to do so. The

discharge plan for this patient, including the patient's information regarding what to look for in terms of complications, was insufficient and the follow-up interval of nearly 14 days was overly long by more than a week.

Although diabetics are predisposed to complications such as gas gangrene, the deviations from existing standards of care, were the result of Dr. #1's inadequate Emergency Ward evaluation of this patient, and in my opinion, contributed to the extent that his infection became out of control and resulted in limb loss with a below-the-knee amputation, and subsequent surgical revisions.

Though it could be argued that even under the best of circumstances one cannot guarantee that limb loss might still have occurred, it is more likely than not, in review of these records, that this patient's limb could have been salvaged by earlier and more aggressive consideration and treatment of soft-tissue infection of the left foot. Indeed, documentation by Dr. #1 established that good pulses were present on this foot. This indicated that sufficient vascular supply was available to enable aggressive medical and surgical management to result in limb salvage.