To the Editor:

*Pasteurella multocida* is a small, gram-negative coccobacillary organism that is non–spore-forming and nonmotile. The reported incidence of infection with *P. multocida* in humans has been estimated to be 1 in 100,000. The true incidence, though, is thought to be higher because the organism is not always suspected when diagnosing infections and adequate cultures may not have been taken. Cats have been shown to be responsible for 76% of *Pasteurella*-infected wounds, and dogs account for the remaining 24%. In addition, *Pasteurella* has been isolated from the digestive system or respiratory tract of rats, mice, rabbits, cattle, sheep, swine, reindeer, horses, monkeys, buffalo, lions, panthers, and lynxes. In studies of the oral flora of cats, *P. multocida* was found in 50% to 70% of cases. The fact that cats' teeth are extremely sharp and penetrate easily into tendons, joints, and bones may explain why cats are considered the major source of documented human *Pasteurella* infection.

Penicillin is the drug of choice for treating *P. multocida* infections because of its efficacy, safety, and cost and its minimal inhibitory concentration of 0.1 to 0.8 µg/mL. Susceptibility testing of isolates should always be performed because of possible penicillin resistance. Alternative drugs include ampicillin, the parenteral cephalosporins, tetracycline, and chloramphenicol. Weber et al found that cepahlexin and cefaclor do not achieve levels in blood that are sufficient to treat *P. multocida*. Aminoglycosides, despite their potency against most gram-negative bacteria, are generally ineffective as single agents, and the organism is usually resistant to vancomycin and clindamycin.

**Clinical Presentation**

Biting, scratching, or licking by animals is the predominant cause of *Pasteurella* infection in humans. However, infections associated with inhaled microorganisms, or with no known source of acquisition, have been reported. *Pasteurella multocida* infection in humans usually presents as a focal soft-tissue infection; however, septic arthritis, osteomyelitis, abscess, and septicemia with respiratory or central nervous system involvement have been reported. The most common manifestations of *P. multocida* infections are local wound infections with cellulitis, which account for up to 80% of cases. Such infections are characterized by acute onset of erythema, pain, and swelling, usually within hours of the causal incident. The short delay of local symptoms (3 to 6 hours) strongly suggests a *Pasteurella* infection. Serosanguineous drainage from the lesion is often noted 24 to 48 hours after the onset of symptoms. Lymphangitis occurs in about 20% of patients, and regional lymphadenitis develops in about 10%. When the incubation period is more than 24 hours, the differential diagnosis should include staphylococcal or streptococcal infection, cat-scratch disease, and tularemia.

Septic arthritis due to *P. multocida* is rare and most commonly follows local extension from a wound or direct inoculation into a joint by a bite. Septic arthritis has been associated with rheumatoid arthritis and prosthetic joints and has a predilection for previously damaged joints, especially in immunocompromised hosts. The authors report on a case of *P. multocida* in the right first metatarsophalangeal joint along with the existence of acute gout.

**Case Report**

An 81-year-old woman presented to the emergency department with the chief complaint of pain in the right foot. The patient stated that over the previous 7 days there had been increased pain, swelling, and warmth in the right big toe and recent onset of fever and chills. The patient denied any trauma to the right foot. Her medical history was significant for hypertension, hypothyroidism, chronic renal failure, coronary artery disease, atrial fibrillation, congestive heart failure, anemia, and gout. The patient had no known drug allergies. The only surgical history was a left knee replacement in 1990.

The patient was admitted to the hospital, and testing revealed a temperature of 99.6°F, respirations of 20, heart rate of 64, blood pressure of 114/45, and unremarkable laboratory findings. Cefazolin (1 g intravenously every 8 hours) was prescribed, and the podiatry department was consulted.

The next day, the right first metatarsophalangeal joint was tapped under sterile conditions using 2% plain lidocaine. Approximately 2 mL of creamy fluid was aspirated and sent for laboratory analysis for...
presence of crystals, cell count, and culture and sensitivity testing. A clinical diagnosis of gout was made and the patient was started on prednisone (20 mg by mouth, twice a day) and colchicine (0.6 mg by mouth, once a day). The synovial fluid of the tap revealed a white blood cell count of 132,750/mm³ (polymorphonuclear neutrophils, 92%), with many monosodium urate crystals and rare gram-negative rods. The gram-negative rods were originally thought to be contaminant; however, final cultures were pending. By day 4 there was some decrease in pain in the right first metatarsophalangeal joint, but the joint was still red, hot, and swollen. At this time, the patient was switched to ceftriaxone (1 g intravenously once a day), the prednisone was lowered to 10 mg twice a day, and a second tap was performed, again revealing approximately 1 mL of purulent material that was analyzed for crystals, cell count, and culture and sensitivities. The synovial fluid of the second tap revealed a white blood cell count of 18,750/mm³ (polymorphonuclear neutrophils, 91%), few monosodium urate crystals, and no organisms.

After 8 days, with minimal decrease in pain in the right first metatarsophalangeal joint, the cultures finally identified P multocida susceptible to ampicillin, cefazolin, ofloxacin, gentamicin, and trimethoprim–sulfamethoxazole. The patient said that she owned two cats, and they had scratched her many times on her feet. Following the diagnosis of P multocida septic arthritis with acute gout, the treatment consisted of amoxicillin (500 mg by mouth every 6 hours), colchicine (0.6 mg by mouth, twice a day), and serial taps of the first metatarsophalangeal joint until cultures were negative. The patient was discharged with instructions to take amoxicillin (500 mg by mouth every 6 hours) and colchicine (0.6 mg by mouth, twice a day) for 4 weeks.

**Discussion**

This report of the dual existence of gout and P multocida underlines the importance of a thorough evaluation of an acutely inflamed joint. According to a recent study on septic arthritis in the ankle, diagnosis in patients with coexistent septic arthritis and crystal-induced arthritis was not readily achieved, often because these patients were empirically treated for gout alone or pseudogout without arthrocentesis.¹⁰

Even though this is the only documented occurrence of P multocida with acute gout in the first metatarsophalangeal joint, it is important to remember that leukocytosis with more than 75% polymorphonuclear cells and an increased sedimentation rate can be expected in cases of both gout and septic infection. The definitive diagnosis of gout is made by the appearance of intracellular, monosodium urate crystals in leukocytes aspirated from the synovial fluid of involved joints.¹¹ ¹² The only way to establish a co-infection with gout is with a laboratory culture and sensitivity testing. In addition to the many proposed causes of gout, infection may induce the development of crystal arthropathy by promoting release of crystals from cartilage, or by lowering the pH of the joint space, leading to crystal precipitation.¹¹

Antibiotics and multiple joint aspirations can result in successful treatment of P multocida septic arthritis. According to the literature, open drainage does not appear to be necessary unless a prosthetic joint is infected, which may require removal of the prosthesis.⁵ Ewing et al., in a review of 14 cases, found no advantage to open or tube drainage, with or without irrigation, over simple needle aspiration for treatment of this infection.

This case shows the importance of evaluating for more than one pathologic process when a patient presents with an acutely inflamed, red, hot, and swollen joint. The evaluation should include questioning the patient about animal exposure, with a careful search for bites or scratches on the affected limb. Such thorough evaluation may speed up the diagnosis of P multocida–related infection.

**References**


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Lipoma of the First Metatarsophalangeal Joint

To the Editor:

The most common benign neoplasm of soft tissue is a lipoma. Approximately half of all soft-tissue tumors are lipomas.1, 2 They are rarely found in the hands and feet but are common elsewhere in the body.3, 4 A laboratory review of 67,000 foot tumors and lesions demonstrated this rare occurrence at this site: only 0.24% were diagnosed as lipomas.5 Most lipomas grow insidiously and cause few problems other than their presence as localized masses.

The most common sites for lipomas are areas of abundant adipose tissue, which explains their rare occurrence in the foot. There are several reports that document this rarity. Adair et al reviewed 134 patients having 352 lipomas; none occurred in the feet. Booher,4 in reviewing tumors of the feet over a 13-year period, found only 2 lipomas in a total of 155 masses.

Patients often ignore these soft-tissue masses of the feet and seek the advice of a physician only after the mass has become unusually large, which may present either a cosmetic problem or a neurovascular problem due to impingement.

Lipomas are extremely rare in young individuals; they are usually found in obese, middle-aged people, with women more frequently affected than men. Race does not seem to be a factor in frequency of occurrence. Formation of lipomas can be related to trauma or to radiation treatment.

Microscopically, lipomas are composed of mature fat cells. These cells are made up of large lipid vacuoles and a nucleus that is eccentrically located within the cell. The lipoma is surrounded by a thin capsule, which gives it a lobular pattern. Some types of lipomas may have collagen, mucoid substance, and vascular network interspersed within the mass.1

Lipomas are generally asymptomatic, insidiously growing, round or oval soft masses. The mass is usually 1 to 2 cm in diameter, rarely exceeding 5 cm.1, 2, 6 Lipomas may be solitary or multiple masses, but are more commonly solitary.1, 2, 6 Upon examination, the mass is freely movable and is usually not tender on palpation. If a cutaneous nerve is involved, paresthesia is not uncommon. Erythema is rare in cases of lipoma.

A diagnosis of lipoma is based on physical examination, conventional radiographs, magnetic resonance imaging (MRI), and computed tomography (CT). A lipoma appears as a radiolucent mass on radiographs. A CT scan and MRI can be beneficial in determining the relationship between a soft tissue and the surrounding structures.1, 7

Benign soft-tissue masses that must be considered in the differential diagnosis of a lipoma include fibromas, hemangiomas, ganglionic cysts, and rheumatoid nodules. Liposarcoma is the primary malignant soft-tissue mass in the differential diagnosis of a lipoma. The malignant potential of a lipoma is rare, particularly in the hands and feet. In one extensive review, only 8% of approximately 4,800 sarcomas were found below the knee.8

The treatment of choice for large or symptomatic lesions is surgical excision. The recurrence rate is about 5%.2

Case Report

A 44-year-old woman presented to the Eisenhower Army Medical Center in Ft. Gordon, Georgia, with the chief complaint of a “bunion” on her right foot. She was seen by the staff of the family practice clinic and referred to the podiatry service for treatment for hallux valgus. The patient related a slow onset of the mass; she had not paid much attention to the mass until it began to interfere with the wearing of shoes.

Her medical history was unremarkable; she was not taking any medications and denied any allergies. She was overweight and stated that she was trying to lose weight. Her family history was unremarkable.

Physical examination of her right foot revealed a large soft-tissue mass involving the first metatarsophalangeal joint (Fig. 1). The mass was oval and
completely covered the medial aspect of the joint. It was firm in consistency and firmly attached to the underlying tissue. The patient had some paresthesia distal to the hallux, but was otherwise neurovascularly intact.

Standard radiographs were obtained (Fig. 2). Initial evaluation of the plain films revealed increased soft-tissue density on the medial aspect of the first metatarsophalangeal joint. No osseous involvement or surrounding bone destruction was evident. A three-phase bone scan and a CT scan were ordered. Laboratory tests—complete blood count, erythrocyte sedimentation rate, and complete chemistry profile— were also ordered. The radionuclide blood-flow study and blood-pool images over the affected area were normal (Fig. 3). The three-phase bone scan images demonstrated mildly increased tracer in the region of the first metatarsophalangeal joint bilaterally. The image results were symmetrical and most consistent with mild degenerative changes involving both first metatarsophalangeal joints of the feet; they did not suggest bony involvement in a soft-tissue tumor. The CT scan revealed a lobulated mass on the medial side of the first metatarsophalangeal joint (Fig. 4).

The patient underwent excision of the soft-tissue mass. The procedure was done through a medial, linear incision under local and intravenous sedation. The mass was readily identified. It was multilobulated and involved the medial dorsal digital nerve to the

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**Figure 1.** Clinical appearance of the right foot on initial presentation.

**Figure 2.** Dorsoplantar view of both feet showing increased soft-tissue density on the medial aspect of the first metatarsophalangeal joint of the right foot. There is no evidence of osseous involvement or bunion deformity.

**Figure 3.** Three-phase bone scan showing mildly increased tracer in the region of the first metatarsophalangeal joint bilaterally.

**Figure 4.** Computed tomographic scan showing a lobulated mass on the medial side of the first metatarsophalangeal joint.
The author has presented an unusual case of a lipoma involving the first metatarsophalangeal joint of the foot. Symptomatic lipomas should be surgically excised.

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References


Additional References

Lower-Extremity Gangrene Secondary to Disseminated Intravascular Coagulation

To the Editor:

Purpura fulminans is a rare multisystem disorder characterized by hemorrhagic skin lesions that progress to gangrene. The gangrene most commonly occurs in the distal lower extremities and tends to be symmetrical in nature.1 The trunk and face can also be affected.1, 2 Clinically, the patient with purpura fulminans has concomitant disorders including septicemia, shock, and disseminated intravascular coagulation. Other entities that can cause peripheral gangrene include congestive heart failure, myocardial infarction, pulmonary emboli, endocarditis, vasculitis, obstetric complications, leukemia, trauma, and acute hepatic failure.3,5

The diagnosis of disseminated intravascular coagulation can be confirmed by several laboratory findings. Prothrombin time, activated partial thromboplastin time, and thrombin time may be either elevated or decreased in patients with disseminated intravascular coagulation. Elevated fibrin split products are found in 85% to 100% of patients with disseminated intravascular coagulation.4 In a review of patients at the University of California at Davis Medical Center, leukocytosis, prolongation of clotting time, and decreased fibrinogen levels were common.4 A decreased platelet count of below 50,000/mm³, however, was the most consistent clinical finding.4, 6

Purpura fulminans usually occurs in children, but cases have been reported in adults. There are two clinical presentations of this illness. The acute state is associated with infection and septicemia. The chronic state is diagnosed in patients who present several days after a febrile illness such as streptococcal group A throat infection.

Several microorganisms have been reported to cause purpura fulminans and disseminated intravascular coagulation. Meningococcus and varicella are most often associated with these illnesses. Other organisms, including Staphylococcus, Streptococcus, and several others, are causative factors in disseminated intravascular coagulation (Table 1). The mucopolysaccharides of the bacterial coat damage endothelial cells by activating the Hageman factor, thus activating the coagulation cascade. Platelets and leukocytes are also involved in this initial reaction. Because of the initiation of the coagulation process, hemorrhage and intravascular thrombosis occur in the venous capillaries, leading to disseminated intravascular coagulation.5, 6

As the disease process continues, increased vascular permeability originating from septic shock causes intravascular volume loss. In turn, hypovolemia causes peripheral vasoconstriction and circulatory stasis. The end result is intravascular coagulation and thrombosis in the vessels of the lower extremities and skin. The resulting purpura varies in color from light brown to dark red and blue, which indicates a deep vascular thrombosis and progression into the subcutaneous tissue.

The case report presented here describes a patient with human immunodeficiency virus (HIV) and endocarditis caused by S aureus that was complicated by purpura fulminans with subsequent loss of lower-extremity digits bilaterally.

Case Report

A 42-year-old woman presented to the emergency department with the chief complaint of epigastric pain and fever that had begun 4 days previously. The patient’s medical history was significant for HIV infection, peptic ulcer disease, chronic active hepatitis C, and endocarditis. The patient denied having any allergies and was not taking any medications. Physical examination of the lower extremities revealed that her neurovascular status was grossly intact. No clubbing or cyanosis was noted, and there were no remarkable changes to the lower extremities. The patient was admitted to the hospital, after which she developed respiratory failure and was intubated. Blood cultures

Table 1. Common Pathogens Causing Purpura Fulminans

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<td>Streptococcus pneumoniae</td>
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<td>Clostridium species</td>
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<td>Gram-negative</td>
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<td>Rickettsia species</td>
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repeatedly revealed *S. aureus* organisms. A trans-esophageal echocardiogram showed vegetations on the prosthetic valve in the tricuspid area. The patient developed multisystem organ failure.

Laboratory studies, including complete blood cell count with differential, prothrombin time, partial thromboplastin time, and fibrinogen levels, were performed during the patient’s hospital stay. The white blood cell count ranged from a high of 22,300/mm$^3$ during the first week after admission to 8,900/mm$^3$ within a month’s time. The initial platelet count of 227,000/mm$^3$ dropped to 42,000/mm$^3$. Prothrombin time was elevated at 16.1 seconds and partial thromboplastin time was elevated, with the highest value being 45 seconds. The disseminated intravascular coagulation profile showed the fibrin split product to be greater than 20 µg/mL. The fibrinogen value was 424 mg/dL and the D-dimer was +2 mg/mL. The patient was initially treated with intravenous fluids and antibiotics.

One week after the patient was admitted, a podiatric consultation was obtained because of ischemic, cyanotic changes that were noted on all digits of the patient’s lower extremities. These changes began distally and progressed to the base of the digits just proximal to the web space. No cellulitis or edema was noted. Both legs were warm to the touch and had palpable pedal pulses. Dry gangrenous changes (nonsupple, black, nonviable skin without any drainage) progressed until full demarcation occurred at the distal forefoot level (Figs. 1 and 2).

After the acute phase of the purpura fulminans subsided, it was decided to operate; the surgical plan was to perform bilateral transmetatarsal amputations once the patient was medically stable. Almost 6 weeks after admission to the hospital, the patient underwent surgery. Two convex incisions were deepened using blunt and sharp dissection to the level of the metatarsophalangeal joints of the right foot. The distal aspect of the forefoot was disarticulated from the foot at the level of the metatarsophalangeal joints of the right foot. Linear capsular incisions were made on the dorsal aspects of metatarsals one through five, and all capsular and periosteal tissue was reflected to expose the metatarsal heads and shafts. A sagittal saw was used to transect each metatarsal from dorsal distal to proximal plantar. The natural parabola of the foot was maintained. Upon inspection, the remaining portions of skin and soft tissue were noted to be healthy and viable. A plantar flap was brought from the plantar to dorsal aspect to provide adequate coverage of the metatarsals. The left-foot amputation was performed 7 days later because of an intraoperative increase in blood pressure in the first surgery.

The pathology report stated the diagnosis of gangrene, acute necrotizing inflammation of the forefoot. The postoperative history was unremarkable and the patient was discharged from the hospital 7 days after the second surgery (54 days after admission). The patient made follow-up visits to the podiatric clinic. Sutures were removed 2 weeks postoperatively, and the patient had eventual complete healing of both amputation sites.

**Discussion**

This case demonstrates one of the effects of septicemia on the lower extremities. Devastating skin changes can occur that range from multiple areas of

**Figure 1.** Preoperative clinical appearance of the dorsal aspect of the patient’s feet.

**Figure 2.** Preoperative clinical appearance of the plantar aspect of the patient’s feet.
thrombosis to frank gangrene of the digits, the entire foot, or the leg.\textsuperscript{7,8}

The treatment of purpura fulminans varies according to the phase of the illness. Treatment of the acute phase, which is characterized by skin lesions, shock, fever, and signs of disseminated intravascular coagulation, is mostly supportive.\textsuperscript{7,9} Correction of the hypovolemia and prescription of specific antibiotics are the priorities at this time. Shock can be treated with correction of the intravascular and interstitial volume deficit.

Heparin therapy has been advocated in the treatment of the coagulopathy.\textsuperscript{10} The mechanism of action in heparin therapy involves inhibition of the coagulation cascade, which inhibits development of intravascular thrombosis. In this case, the use of heparin was contraindicated because of the patient’s endocarditis.

After the acute phase has passed, treatment becomes rehabilitative, consisting of meticulous wound care to prevent secondary infections. Debridement or amputation of nonviable tissue may be necessary. Amputation should not be performed until optimal demarcation occurs and the patient is medically stable. Skin grafting may be necessary if initial amputation sites are not closed at surgery.

Amputations were performed on the patient in the case presented here only after the digital necrosis demarcated to the level of the bases of the proximal phalanges. With careful dissection and a good blood supply, the patient healed completely without any complications.

It is important for the podiatric physician to be aware of the rapidly progressing skin changes associated with a laboratory diagnosis of disseminated intravascular coagulation. If they are detected early enough, heparin therapy, if not contraindicated, and supportive care can minimize damage to the extremities, thus decreasing the need for amputation and extensive debridement.

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References


Free Tissue Transfer in the Treatment of Diabetic Foot Ulcers

To the Editor:

Until the mid-1980s, reconstruction of large foot wounds in patients with diabetes mellitus was uncommon.\textsuperscript{1} Diabetes has traditionally been considered a contraindication to microvascular free tissue transfer.\textsuperscript{2} Diabetic patients were thought to have an increased risk of small-vessel disease, which could lead to flap failure. Recently, however, studies have shown that diabetic patients with occlusive disease have greater involvement of the tibial and peroneal arteries than patients without diabetes.\textsuperscript{3} This finding prompted more aggressive approaches to the treatment of diabetic foot wounds.\textsuperscript{4}

Only a few studies of free tissue transfer in patients with diabetes have been reported. A study conducted by Lai et al\textsuperscript{5} demonstrated the success of reconstruction using free muscle flaps. The effectiveness of the free muscle flap in the management of extensive defects of the foot and infected wounds, including those caused by osteomyelitis, has been well established.\textsuperscript{5}
Shallow wounds with intact paratenon may be safely closed with split-thickness skin grafts. In cases of exposed bone and tendon (without paratenon), flap coverage is required. A flap is a mass of tissue (skin, muscle, or bone) for grafting that either retains its own blood supply (in the case of a pedicled flap) or has its blood vessels reattached to local vessels (microvascular free flap). Local flaps are developed from tissues near the wound being reconstructed. Distant flaps are developed at some site distant from the recipient wound. Pedicled flaps are transposed to the recipient wound bed. Free flaps have their original vascular pedicle divided and re-anastomosed to vessels near the recipient wound bed. Free tissue transfer offers many advantages for foot and ankle reconstruction in the patient with diabetes. Free tissue transfers are not dependent on the vascularity of the wound bed.

The muscles frequently used for free tissue transfer are the latissimus dorsi, rectus abdominis, and gracilis muscles. These donor sites heal with little deformity other than a linear scar. The latissimus dorsi is large and thin, providing coverage of most foot defects. The vascular pedicle is dependable, with large-caliber vessels for microsurgical transfer. The rectus abdominis is intermediate in size, but provides coverage of extensive wounds as well. Typically, the flap has two venae comitantes of sufficient caliber for anastomosis. The gracilis is a long, narrow muscle with a pedicle of only about 8 cm in length, and thus with less vasculature available for anastomosis at a distant site.

The presence or absence of vascular disease often dictates the type of reconstruction that can be performed, because the majority of flaps suitable for plantar foot reconstruction are based on blood flow through the posterior tibial artery and its medial and lateral branches. Therefore, patients who have recently undergone distal vascular bypass may not be good candidates for local arterial flaps. These wounds may require free tissue transfer. When distal bypass surgery has been performed, direct arterial anastomosis to the bypass graft is always preferable. If more proximal revascularization is performed, the distal vasculature must be evaluated for its suitability to receive transplanted tissues. This evaluation is best accomplished with a combination of arteriography and duplex imaging.

Postoperative management is critical to the recognition and control of potential complications. Splint immobilization, elevation, and strict bed rest are necessary for 7 to 10 days. Areas of skin grafting are left undisturbed for 4 to 5 days. Interventions to decrease the likelihood of anastomotic thrombosis include aspirin, intravenous heparin, and dextran. Flaps are evaluated hourly with Doppler ultrasonography for 24 to 48 hours to assess viability, as evidence of arterial or venous compromise requires immediate operative intervention. Activity is increased gradually, starting with progressive dangling of the extremity with compression to control edema. With the assistance of physical and occupational therapy, non-weightbearing ambulation is begun. Weightbearing is delayed until wound healing is complete.

Case Report

A 50-year-old man was referred to the emergency department at New York Hospital in New York City by his primary-care physician because of an ulcer on the dorsum of the right foot that was associated with fever, chills, swelling, pain, and erythema. Five days previously, he had noticed a blister on the medial dorsum of the right foot after a period of wearing tight shoes. The blister ruptured, and a nonhealing wound developed, followed by swelling, erythema, pain, fever, and chills. The patient’s medical history was significant for diabetes mellitus, which was controlled by diet.

On admission, the patient had a temperature of 37.7°C; it subsequently rose to 39.4°C. The blood pressure was 139/77, the pulse was 96, and respirations were 18. The right foot had a 5 × 3-cm partial-thickness ulcer with moderate edema and erythema, and there was a palpable dorsalis pedis pulse. There was no exposed bone or muscle and no purulent drainage. There was a mild decrease in sensation. An x-ray was negative for osteomyelitis. The patient’s white blood cell count was 12,400/mm³, and his blood glucose level was 437 mg/dL.

After consultation with a vascular surgeon, a subcutaneous abscess was drained. Local wound care with wet-to-dry dressing changes, intravenous broad-spectrum antibiotics, and control of blood glucose level were begun. The patient remained febrile, and his white blood cell count increased to 15,400/mm³. Upon surgical exploration, extensive necrotic tissue and multiple abscesses were found. The patient underwent radical debridement of soft tissue, including the extensor tendons of the great toe. Intraoperative cultures revealed group B streptococci, staphylococci, and Proteus organisms, and intravenous antibiotics were adjusted. The temperature and white blood cell count entered normal ranges, the cellulitis resolved, the edema decreased, and the wound began to granulate.

A plastic surgery consultation was requested to evaluate a 10 × 8-cm full-thickness wound with an ex-
posed distal first metatarsal for wound coverage (Fig. 1). A right lower-extremity angiogram was normal. The patient then underwent debridement, irrigation, and wound coverage with a rectus abdominis muscle free flap (Figs. 2 and 3). The deep inferior epigastric vessels were anastomosed to the anterior tibial vessels, and the muscle was covered with a split-thickness skin graft from the right thigh (Fig. 4). The abdominal wound was closed primarily, and the skin graft donor site was covered with a nonadherent dressing. Perioperative intravenous antibiotics were administered, and the flap viability was monitored by means of Doppler ultrasonography. Low-molecular-weight dextran, chlorpromazine, and aspirin were used to increase anastomotic patency. The patient did well and was discharged 2 weeks after admission.

Discussion

This case report has described the use of free tissue transfers in the treatment of diabetic ulcers with exposed bone. Free flaps allow immediate closure of wounds, speed wound healing, and limit the potential for bone infection, thus reducing the chances of more extensive amputation.
References


