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## Communications

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# Calcaneal Osteomyelitis of the Newborn: A Case Report

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Osteomyelitis of the underlying calcaneus secondary to multiple heel punctures has previously been described in five instances. This paper describes a further case and reviews some of the problems associated with heel puncture, indicating measures that can be taken to avoid such infection.

### Case Report

A 2,640 gm infant was born at 36 weeks gestation with Apgar scores of 6 and 8. Two hours after delivery, transient tachypnea of the newborn developed, clearing within four hours. Jaundice developed on the third day of life, with the bilirubin level rising to a peak of 18.1 mg/100 ml (direct bilirubin 1.0 mg/100 ml). The baby received daily heel punctures on alternate feet for blood samples up to the seventh day. Discharge examination on that day revealed a grossly swollen, red, fluctuant abscess of the right heel, related to a puncture site. The abscess was incised and 1 cc of pus was drained.

No clinical evidence of systemic sepsis was found and at all times the temperature remained normal. The baby fed well on the breast and gained weight. Initial therapy consisted of oxacillin 200 mg/kg/day for ten days and kanamycin 20 mg/kg/day while awaiting the results of bacterial culture from the abscess and venous blood. Coagulase positive staphylococcus was grown from both these sites and the infant was given a course of parenteral oxacillin 200 mg/kg/day for ten days commenced on the ninth day of life.

Sequential x-ray films of the right heel demonstrated rarefaction of the calcaneus consistent with osteomyelitis.

There was marked improvement over ten days and the infant was discharged at the age of 19 days on oral cloxacillin 100 mg/kg/day to be continued for two weeks. Follow-up x-ray films demonstrated reossification of the right calcaneus.

### Discussion

Osteomyelitis of the os calcis is rare in infants and usually is secondary to multiple heel puncture, either by spread from local cellulitis or by direct puncture of the periosteum or calcaneal cartilage by the lancet.<sup>1-3</sup> The organism most commonly involved is coagulase positive staphylococcus aureus. In this report, as in other cases, there appears to be little systemic disturbance and often no fever in the infant. All cases respond rapidly to a course of parenteral antibiotics, and local incision and drainage of the abscess.

Routine puncture wounds of the heel in neonates used to obtain blood samples normally show healing without scarring, although local hemorrhage is not infrequent. The pericalcaneal tissue and calcaneus are often penetrated by the lancet (usually without any untoward effects) in small infants where the amount of heel tissue is relatively sparse. Blumenfeld et al studied heels of 40 children at necropsy, most of whom had multiple heel punctures, and subsequently recommended that punctures should be performed on the most lateral and medial aspects of the plantar surface of the heel. They stated that the posterior curvature should be avoided since the os calcis is close to the skin at this point. The puncture should not be deeper than 2.4 mm and should not be made

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through previous puncture sites which may be superficially infected.<sup>2</sup>

X-ray films demonstrate changes typical of osteomyelitis only after 10 to 14 days and usually show bone resorption in the area of the plantar cortex in osteomyelitis due to puncture wounds. In the case of older children with hematogenous osteomyelitis, there is usually destruction of the calcaneal epiphysis and metaphysis. Reossification usually takes three to four months, but has been noted to take up to three years.

The development of this iatrogenic complication of nursery care may carry with it considerable difficulties in dealing with both hospital staff and parents. If more than one person is involved in obtaining blood from the infant, identification of possible carriers of staphylococcus aureus is complicated. The physician must be sensitive to the concerns of the parents not only regarding the

etiology of the problem, but also in dealing with their emotional reactions towards those entrusted with the care of their child.

There is some controversy regarding the duration of antibiotic therapy in such cases. Ten days of antibiotic therapy may be adequate for infection derived from local sites, but many authors recommend treatment for from three to six weeks on the basis of possible systemic infection.<sup>2</sup>

#### References

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## Social Support and Utilization of Medical Care

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There is accumulating evidence that the availability and quality of social relationships affect an individual's health.<sup>1-4</sup> Social support is conceptualized as a valuable resource that enhances host resistance to environmental stresses.<sup>5,6</sup> In this conceptual model a deficient lay support system increases vulnerability to illness and predisposes to utilization of medical services. This pilot study tests the hypothesized association of weak social support with increased use of professional services in a rural primary care setting.

### Methods

The study population consisted of adult users of the only source of primary care in a midwest farm

community of 500 people. This clinic was staffed by a family nurse practitioner and a family physician and provided services three half-days a week. Demographic, socioeconomic, and family data were collected at the time of user registration. Information about each encounter was recorded on special forms by the provider. A utilization rate was calculated for each user by dividing the number of clinic visits by the number of days since registration, which occurred at the time of the first visit.

At the end of the first ten months of clinic operation a questionnaire was mailed to each user. Among the questions were two which assessed availability of social support: "When you are sick, is there a family member or friend who helps care for you?" and "Do you have a special person you confide in or talk to about yourself or your personal problems?" One question assessed health status: "How would you rate your overall

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