A Case History

Clinical Indication for Flexible Above-Knee Prosthetic Socket

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R.W. is a 62 year old male with a 32 year history of insulin dependent diabetes mellitus. He was in a normal state of good health until August, 1982 when he developed gangrene of the first three toes of his left foot. A left femoral popliteal bypass was performed unsuccessfully. He then underwent a left below-knee amputation which also was unsuccessful and, in October, 1982, a left above-knee amputation was done. In December, 1982, he was admitted to the Institute of Rehabilitation Medicine, NYU Medical Center (IRM-NYU) for a prosthetics rehabilitation program. At that time, his stump became infected and dehissed, requiring stump revision.

In July, 1983, he was readmitted to IRM-NYU and started on gait training with an AK prosthesis with a semi-suction socket, hip joint and pelvic belt, polycentric knee joint (Lang) and SACH foot (Figure 1). During the course of his rehabilitation training, he began complaining of pain at the distal stump. The socket was adjusted numerous times by alternately relieving painful areas distally and placing padding above these areas, but with little success. Subsequently, x-rays taken of the stump revealed a small amount of soft tissue calcification distally with a small spur at the posterior lateral side of the femur (Figure 2). The patient was started on anti-inflammatory agents which provided a moderate amount of pain relief. However, he still had difficulty ambulating secondary to stump pain.

A lateral pad above the distal end was inserted into the prosthesis which relieved some of the pain. However, within a few days, the patient developed a skin break-
down in the left peroneal area, and an erythematous area on the distal stump. The patient was not allowed to wear his prosthesis for 2½ weeks. During this time, a repeat stump x-ray showed a large spur in the posterior lateral side of the distal stump and more soft tissue calcifications on the anterior surface of the stump (Figure 3). Consequently, a new socket was designed to give relief over the distal anterior and posterior stump in order to decrease the pain and improve ambulation.

This socket consisted of a vacuum-molded inomer (Surlyn®) flexible socket contained in plastic laminated socket. There were fenestrations put into the anterior (Figure 4) and posterior walls (Figure 5) of the rigid outer
socket, which afforded relief to the area of spur formation and soft tissue calcification.

The flexible inner socket was chosen for several reasons:

1. Flexibility of the socket results in a more comfortable fit and reduces pressure concentration.
2. Its transparency allows direct visualization of the stump, if skin breakdown is a problem, and to monitor pressure areas.
3. It permits quicker heat dissipation because of reduction in socket wall thickness.
4. The socket allows improved sensory feedback, especially while sitting, due to flexibility in fenestrated areas.

The patient tolerated the prosthesis well, however, he still had pain over the anterior distal stump. Thus, new x-rays of the patient were taken while he was wearing the prosthesis to determine if the fenestrations were, in fact, over the spur and the soft tissue calcifications. Because of the design of this socket, it was easy to determine that the fenestrations needed correction.

The anterior cut out was then enlarged to better accommodate the soft tissue calcification (Figure 6). This afforded the patient the relief needed. He is presently ambulating independently with a straight cane and the above-knee prosthesis without any pain.

In summary, this flexible socket technique allows improved accuracy in fitting not only routine cases, but is especially suited for problem cases as illustrated here.

Figure 6.

Meetings and Events

Please notify the National Headquarters immediately concerning additional meeting dates. It is important to submit meeting notices as early as possible. In the case of Regional Meetings, it is mandatory to check with the National Headquarters prior to confirming date to avoid conflicts in scheduling.

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January 29–February 2, AOPA Business Procedures and Data Committee seminar, Rose Hall Beach and Country Club, Montego, Jamaica. Contact: AOPA National Headquarters, 703-836-7116.


April 12–15, AOPA Region IV Annual Meeting, Waverly Hotel at the Galleria, Atlanta, Georgia.


May 24–26, AOPA Region V Annual Meeting, Amway Grand Plaza Hotel, Grand Rapids, Michigan.

June 1–3, AOPA Region IX, COPA and the California Chapters of the Academy Combined Annual Meeting, Lake Arrowhead, California.

June 21–24, AOPA Region VI and the Academy Midwest Chapter Annual Combined Meeting, Holiday Inn, Merriville, Indiana.


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June 7–9, AOPA Region IX, COPA, and the California Chapters of the Academy Combined Annual Meeting.


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