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An Active Bilateral Above-Knee Amputee—A Case Report

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A bilateral above-knee amputee, A. H., sustained multiple injuries in Vietnam in 1969, at the age of 22, as a result of a booby trap explosion. Following amputation through both lower limbs above the knee, the left stump was 7½ inches in length and the right was 8 inches in length as measured from the public ramus. A. H. was 6'1½" in height prior to amputation and when first seen at the VA Prosthetics Center with his previous limbs he was 5'9". He requested an increase to 6'2" and because he was in excellent physical condition when seen at the VA Prosthetics Center in 1970, this height adjustment was approved since it was felt to be important psychologically.

In addition to the lower-limb amputations, A. H. had amputations of the left index and middle fingers with good function of the remaining fingers. On the right side, there were additional finger amputations. The right first metacarpal and portions of the right 4th and 5th metacarpals remained. Defects had been covered by full thickness skin grafts to both hands. He was able to grasp crutch handles with both hands although he was not able to fully oppose the first metacarpal residual to the residuals of the fourth and fifth fingers on the right. On the left side he was able to oppose the tip of the thumb to the fourth and fifth fingers and had a good grasp. It was concluded that prosthetic devices for the hands would only interfere with function, and therefore were not prescribed.

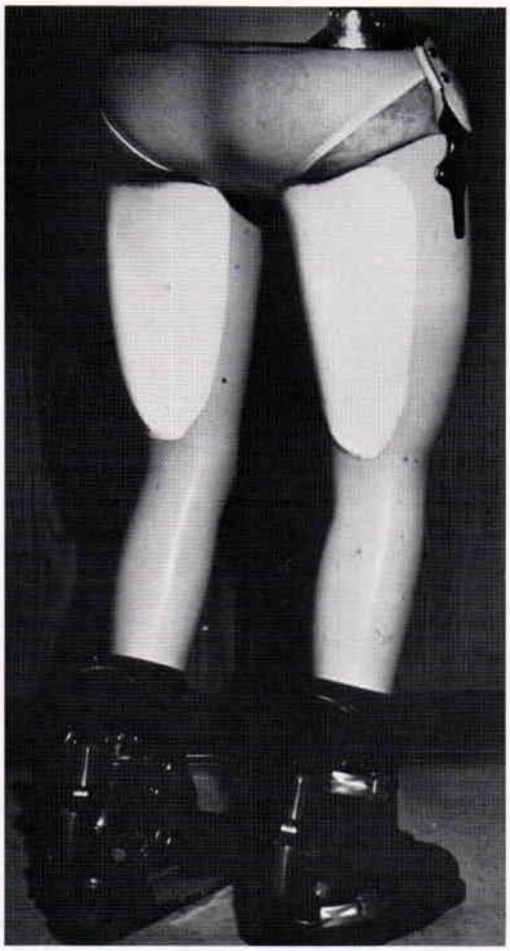

Fig. 1. Above-knee prostheses with rigid knees for skiing rejected by A. H.

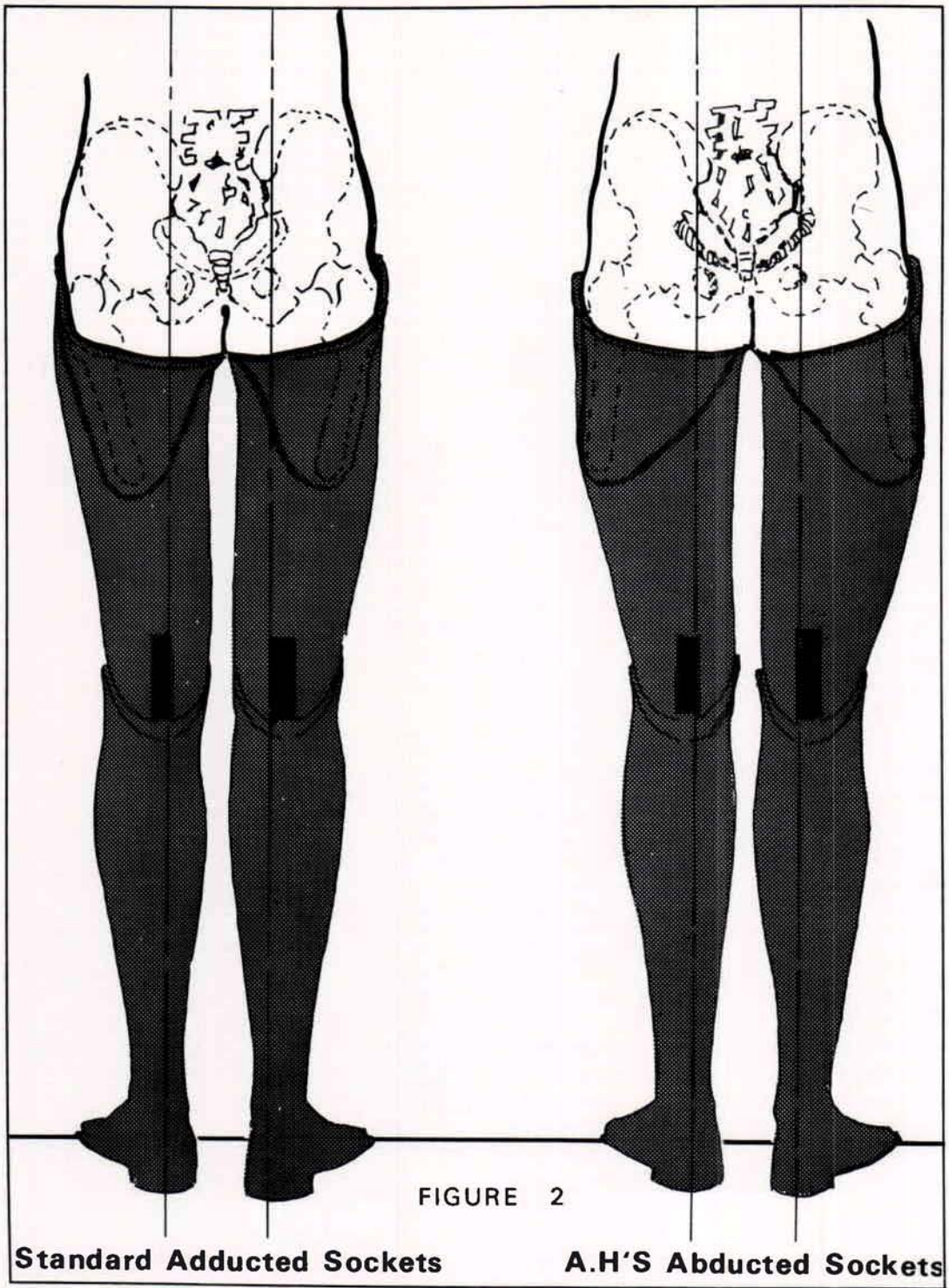

Fig. 2. Comparison of standard practice and A. H.'s skiing prostheses with respect to alignment in the mediolateral plane.

Fig. 3. A. H. in action.

A. H. was strongly motivated. He was fitted with a waist belt, hip joint, partial suction sockets, Mauch S-N-S knees, and single-axis feet. An attempt at fitting him with "total suction" was unsuccessful because of perspiration problems. Following delivery and instruction in the use of S-N-S knees, A. H. walked into the examining room without a cane. He was urged to use one initially, however. He subsequently became active in swimming, boating, horseback riding, and even sky-diving, and then indicated a strong desire to ski. He had been a capable skier prior to amputation, and was anxious to ski again.

Inquiries were made to determine if a similar situation had arisen elsewhere at a prosthetic facility, and it was found that specially designed prostheses had been fabricated by another facility and used by a patient for skiing purposes, but this had been made, as illustrated in Fig. 1., with solid knees. A. H. rejected this concept as too limiting. Prostheses were then fabricated incorporating S-N-S knees, partial suction sockets, nylon waist bands and hip joints, and single-axis feet. The sockets were set in 20 degrees of abduction and the heel centers were brought directly under the ischial tuberosities (Fig. 2). The abduction alignment allowed the adductor muscles to contract, thus allowing his feet to be brought closer together. This, of course, is contrary to standard alignment principles, but the standard alignment for A. H. was found to be insufficient. When the feet were set up with a four-inch walking base he would have greater side-to-side displacement, but more energy would be required. With the walking base set narrower, A. H. was able to obtain greater control of his prostheses and yet still have the option to widen his base.

A. H. found that he could achieve better control and ski parallel with this arrangement. The S-N-S knees proved to be ideal for this patient, and he has become a very proficient skier employing these compoments and outrigger skis. He negotiates a standard slalom course at a respectable speed.

Since sky diving was also important to him, his replacement prostheses were fabricated with Pelite liners to lessen the impact on soft tissues at the level of the brims upon contact with the earth.

A. H. does not use crutches or a cane, and he works out extensively with weights. His occupation has changed from being a manager of a Health Spa to that of director of a cardiopulmonary fitness sports training institute in New York.

Since there is such a variety of prosthetic components available now, the Clinic Team should spend the time to make the prescription that meets indi-

vidual needs. If the patient's motivatpon level and attitude reaches that of someone such as A. H., it is up to us as prosthetists to help meet these individual needs.

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Footnotes

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