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Technical note—modified above-knee socket to relieve anterior pressure caused by abdominal hernia

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Abstract

The plastic quadrilateral socket has a high anterior brim which can cause considerable discomfort in some patients, especially when seated. A simple modification to the anterior brim is described allowing a female patient with a huge abdominal hernia a considerable degree of comfort when both sitting and standing. The creation of a large radius producing a wide area for adequate pressure relief proved valuable. This might be considered for patients with less pendulous abdomens who find conventional methods inadequate.

Problem

A 58 year old lady with peripheral vascular disease had an above-knee amputation. The healing of a cholecystectomy operation was modified by concurrent steroid therapy and a huge ventral abdominal hernia resulted. Conventional prosthetic management did not accommodate the problems generated by the hernia.

Prosthetic management

This patient had a particular problem with the above-knee prosthesis, caused by her pendulous abdomen. When seated, she experienced great discomfort from the anterior brim of the quadrilateral socket. The standard solution to this would be to increase the anterior flare of the brim. This solution proved unsatisfactory as a wide enough flare was not easily attained at cast rectification due to subsequent laminating difficulties, so an alternative solution was sought to redistribute the pressure. Several layers of Plastazote were built up externally on the anterior aspect of the socket, extending over the socket brim, then shaped to increase the radius of the anterior flare. This, as shown in Figure 1, greatly increased the pressure bearing area and thus spread the load from the pendulous abdomen and reduced the discomfort.

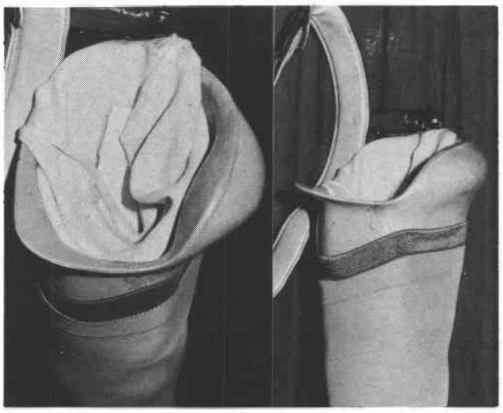

Fig. 1. Quadrilateral socket with anterior Plastazote build up.

Discussion

The amputee population is an aged one. In Dundee 76·1% are over 65 years old and of these, 27·8% are at an above-knee level. The patients are less active than their younger counterparts and spend increasing periods of time seated. Many patients wearing above-knee prostheses with a quadrilateral socket have discomfort over the high anterior brim, in particular during the stance phase and on sitting. During the stance phase considerable force is passed through this area of the socket and in patients with pendulous abdomens considerable problems arise at the interface between the brim of the socket and the anterior abdominal wall. While seated these forces are greatly increased when the abdomen and anterior brim are in close proximity. In some cases, this discomfort is relieved by flaring the brim to allow a greater area for pressure redistribution. The anterior

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brims are generally suitable for standing patients and are biomechanically sound, however, when seated considerable discomfort can arise. Patients who sit for long periods frequently complain of pain which is often not completely relieved by simply flaring the brim. In the case described discomfort occurred both when standing and when seated and it was found that a large area was necessary to redistribute the pressure and this could not be achieved by conventional means. The construction of a built up Plastazote flare provided a large enough area to achieve satisfactory relief of discomfort allowing the patient to walk independently and sit in comfort. The patient described had a fairly severe problem caused by the incisional hernia. However, many patients with less pendulous abdomens do not get satisfactory relief from the simple conventional method of flaring the anterior brim of the socket. The design of the quadrilateral socket does not adequately take into consideration the problems of the seated patients and the solution described above might well be applicable to many other patients, in particular the elderly, for whom comfort has not been achieved.

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