Letter to the Editor

SYME’S/BOYD PROSTHESIS: A NEW MODIFICATION

Syme, Boyd, and Pirigoff amputations are still frequently performed in Asia and Africa for leprosy and trauma. They are usually functionally better than a below-knee amputation because the patient is able to ambulate for short distances without a prosthesis. This is especially helpful at night around the home. Prostheses in developing countries need to be low-cost in order to be able to make them affordable for all. In many developing countries, prosthetic centres are few in number and are often located very far from patients’ homes. The cost and fear of travel can make simple repairs of a prosthesis a major challenge for the patient. As such, the prosthesis must be not only low-cost but also highly durable in order to provide maximal long-term benefit to the patient.

Traditionally the Syme’s/Boyd prosthesis is constructed in Asia using a resin socket attached to the wooden forefoot using leather, or even a simple leather boot with a toe filler. Some centres have glued a SACH foot directly on to the socket, but this creates a rigid foot with subsequent gait problems. In Green Pastures Hospital and Rehabilitation Centre, we have been using (high density polyethylene) HDPE for prosthetic sockets for many years due to its durability, lightweight, and low cost. Rubber is used for the cosmetic forefoot instead of wood. We found, however, that after 8–18 months of use, the leather started to crack at the insertion point into the wooden forefoot, which would require repair. After seeing many examples of this, a simple design modification was carried out. This consisted of using tyre rubber to extend across the join between the rubber forefoot and HDPE socket portions of the prosthesis. It is attached to the plastic and wood by bolts (Figure 1). The actual prosthesis is shown in Figure 2.

To date, 20 have been produced at our center. These have so far lasted an average of 18 months without need for repair (range 5–33). The actual mean duration of usability of the device is still unknown as all of these are still being used without difficulty.

The cost of the materials of production using our design is about $5 US. Total time for production is 21 h.

Figure 1. Diagram of new design.
Conclusion

Using tyre rubber to join the rear and forefoot portions of the Syme/Boyd prosthesis gives a durable prosthesis with a significant decrease in the need for maintenance. The cost of this design is low. This design is recommended for all Syme’s prostheses regardless of the material used for the socket component.

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References


Figure 2. Photograph of new design of prosthesis