

An Alternative Casting Technique For Narrow ML Sockets

Justin Horowitz, C.P.O.
Michael Lefton, C.P.O.

INTRODUCTION

Many articles have been published with regard to new casting techniques for narrow ML socket design. All involve new methods or new equipment. The authors would like to present a new casting technique which will greatly cut down on cast modification time as well as the number of check sockets required.

We began a study on the possible application of the Berkley Brim for casting of a narrow ML socket. Taking a brim for the contralateral side, rotating it 90°, the original posterior seat becomes the medial wall and the medial wall becomes the posterior seat. The Scarpus bulge contours to the posterior lateral region. With this brim, we were able to adjust the ML dimension.

Initially, we found that by utilizing the graph established by Mr. Long (Figure 1-A) and the measurement data sheets designed by Mr. Sabolich and Mr. Shamp (Figure 1-B), we could select the appropriate brim. As we became more comfortable with the system, we found that we could select the appropriate brim size as if we were casting for a conventional quadrilateral socket, but using the contralateral brim.

CASTING

Following the brim selection, a circumferential gauge should be employed to establish your reduced ischial level measurement. Tube gauze is placed on the patient's residual limb and appropriately suspended. The brim is then placed around the limb and moved proximally to contact the ischial tuberosity. The gentle drawing downward of tissues may be required (Figure 2). At this time, check the tissue distal to the brim for even continuity. Adjustments may be required by loosening or tightening the adjustment screws, but do not be concerned with any gaps that may occur between the limb and brim in the posterior region. In this region the residual limb, not the brim, will give you the appropriate contour (Figure 3).

The brim is then removed from the limb, and the trochanter and distal femur are marked. At this time the brim is widened by 2.5 rotations of the adjustment screws. This allows for the thickness of the plaster. In addition, the brim is coated with silicone spray.

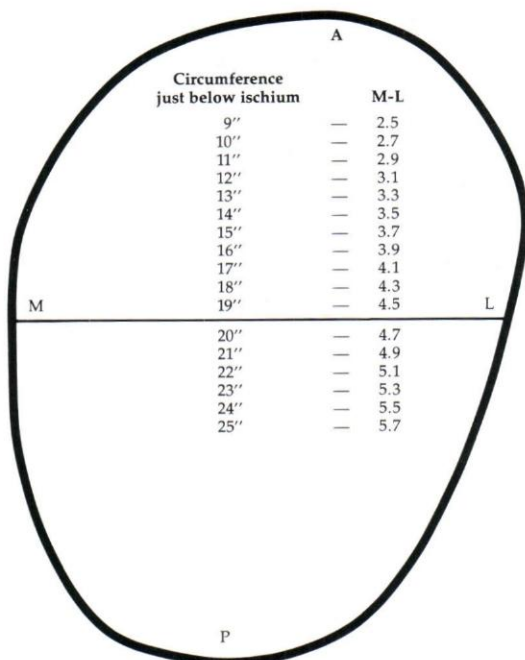


Figure 1-A. Socket pattern for thigh measuring 19". Actual measurement of pattern circumference is 18".

In order to support the femur, it is necessary to narrow the M-L dimension of the socket. The resulting greater A-P allows muscular function not possible with the crowded effect of a narrow A-P. This chart is to be used as a guide in establishing the width of the finished positive model. The figures were taken from approximately 500 sockets made in this facility and many of these sockets have now been worn eight years. Very few, if any, sockets have been replaced because of shrinkage. Many sockets have been replaced as muscles return to normal and the thigh takes on its original shape and size increases. Most of the increase in size will take place in the A-P dimension, with very little change in M-L. Increasing the M-L dimension by anything more than $\frac{1}{4}$ " will result in a lateral gap at the top of the socket.

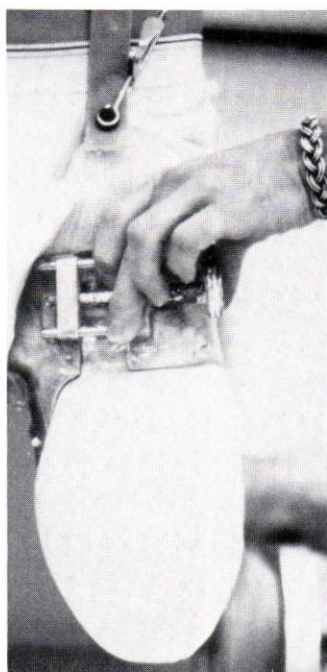


Figure 2. In donning the selected brim on the patient, a gentle drawing downward on the tissue may be necessary.

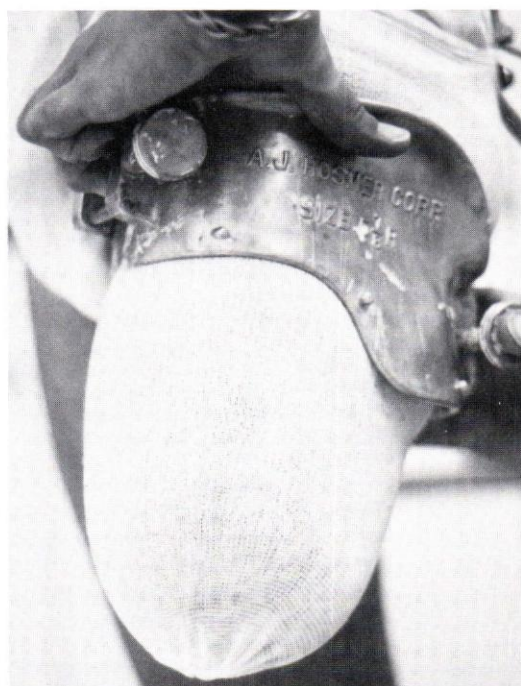


Figure 3. Any gapping in the posterior region should not be a concern, as the residual limb will give you the appropriate contour.

**Contoured Adducted Trochanteric
Controlled Alignment Method**

PROSTHETIC INFORMATION **ABOVE-KNEE PROSTHESIS**

CAT-CAMTM

LOWER-EXTREMITY PROSTHETIC INFORMATION

Date _____ Patient's Name _____ Company Name _____ TELEPHONE _____

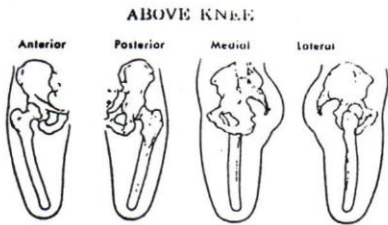
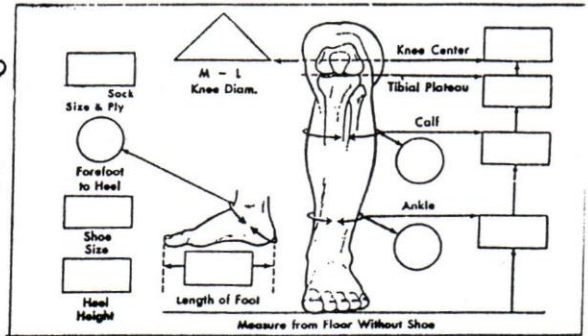
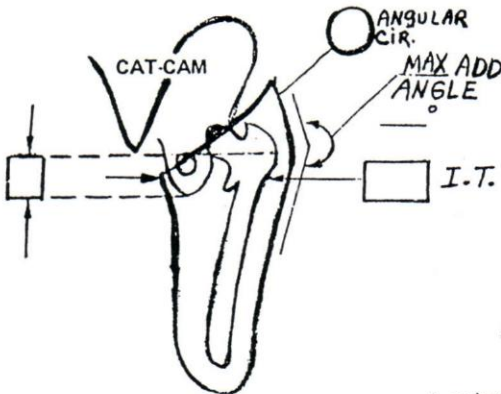
Occupation _____ Soc. Sec. # _____ Street Address _____

Amp. Date _____ Reason _____ City _____ State _____ Zip _____

Site of Amputation _____ Clinic or Hospital _____

Height _____ Weight _____ Age _____ Prescribing Physician _____

MALE ☐ FEMALE ☐ LEFT ☐ RIGHT ☐ Prosthetist's _____



- A = abrasion
B = boil or skin infection
Bu = bursa
Bs = bone spur
D = discoloration
E = edema
I = irritation
M = muscle bunching
P = pressure point
R = redundant tissue
S = scar
T = trigger point

SPECIAL NOTES:

Trochanter _____

Ischial Tub. _____

Sub-Tissue _____

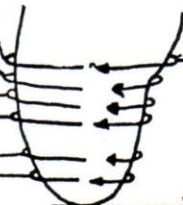
Flex- Cont. _____

ABD-Cont. _____

suction reduct.	ML	Distance Below Ischium	Circum-ference
		0	
		2	
		4	
		6	
		8	
		10	

Mod. Unmod.

CAT-CAM



Trochanter to Anterior Midline _____

Ischial Tuberosity (Standing) _____

RL Length _____

Femur Length _____

To Floor

PROVIDING INNOVATIVE CONCEPTS

Sabolich

IN PROSTHETICS AND ORTHOTICS

ORTHOTICS - PROSTHETICS CENTER

Figure 1-B. Measurement data sheet.

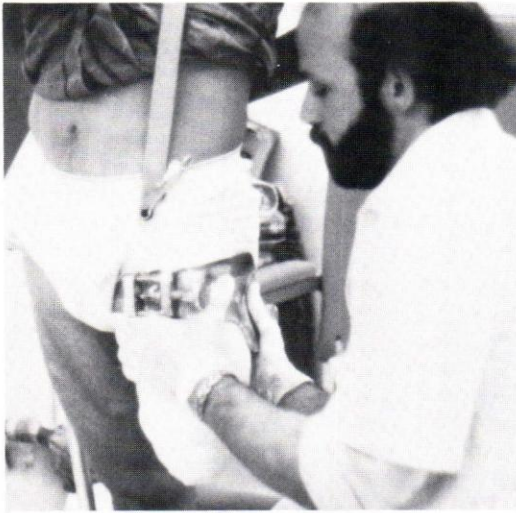


Figure 4. The brim is hand held during the taking of the negative impression with the residual limb in a relaxed position.

Elastic bandage is applied to the limb, covering at least a third of the gluteal musculature. The bandage is then brought into the perineum and drawn towards the inguinal region to finish at least 2" proximal to the trochanter. The proximal wrapping should be four layers thick. Continue wrapping the limb. Once the wrapping is completed, the brim is then applied. The brim will be hand held; The affected limb is held in a relaxed position (Figure 4). With the brim being held firmly against the ischial tuberosity, view the fixture laterally (Figure 5). The top of the brim is held in the same attitude as the limb. When viewing the brim anteriorly, just prior to the plaster setting, have the patient actively adduct, while keeping the brim horizontal (Figure 6). This position is maintained until the plaster has hardened. At this point, a top coat of rigid plaster can be applied to the casting fixture and plaster wrap (Figure 7). In addition, three layers of rigid plaster should be applied to the gluteal region from the brim proximally. Once these layers are hard the negative impression is removed and the length is verified. Positive model modifications are performed according to the previously mentioned authors.



Figure 5. Viewed laterally, the top of the brim is maintained in the same flexion attitude as the residual limb.



Figure 6. Just prior to the plaster hardening, have the patient actively adduct his residual limb.



Figure 7. Once the elastic plaster bandage has hardened, it may be reinforced with rigid plaster bandage.

CONCLUSION

This technique has been tried successfully on three patients. Two patients required only one check socket. Our third patient required two sockets due to weight loss and suction not being maintained. Because of a preshaped proximal portion of the positive model, modification time is reduced by half.

AUTHORS

Justin Horowitz, C.P.O., and Michael Lefton, C.P.O., are with M&M Prosthetic Associates, Inc., RD 2, Rt 28W, Box 194P, Kingston, New York, 12401.