

## Fabrication Of A Prosthesis With A Side Pin Suspension Liner

### Topics

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- Initial Lamination
- Battery Placement for a myoelectric device
- Outer Shell Lamination
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### Introduction to Side Pins

- A custom silicone liner with side pin suspension is an alternative to the common distal pin attachment used to secure liners into laminated sockets.
- These side pins are mainly used to minimize length for long transradial amputees.
- Best location is within the middle third of the forearm towards the distal end and must be fleshy.
- Side pins consist of 2 parts:
  - *Rosette*
    - This part is embedded into the silicone liner and secures the suspension pin.
  - *Suspension pin*
    - This part is used as the suspension mechanism which locks into the hard laminated socket preventing the liner from pulling out of the socket.

### Casting over the definitive liner

- Cast only over the definitive silicone liner while the patient is wearing it.
  - Take the suspension pins out
  - Wrap the liner with saran wrap to avoid getting the liner dirty
  - Using an indelible pencil, mark the electrode and side pin locations
- ***NOTE: The socket can only be fabricated over the DEFINITIVE LINER!!***
- Once all markings are done:
  - Wrap the liner with plaster bandage and press firmly around the side pin location to ensure that it is visible once the wrap is removed
  - Mark the side pin location on the outside of the plaster bandage using the indelible pencil
  - Fill the negative cast and dry

### Initial Lamination

- **Lay Up**
  - Attach the electrode dummies over the first PVA bag at the indicated locations
  - Tuck dacron around electrode dummies
  - 1 layer of finishing stockinette
  - 3 layers of nyglass
  - 3 star washers
  - 3 layers of nyglass
  - 2 layers of finishing stockinette

## **Battery Placement For A Myoelectric Device**

### **• Forearm Shaping**

- Once the initial lamination is complete and the electrode dummies are set in place, find the best location for the battery pack
- There is no problem if the best location for the battery pack happens to be where the side pin is located
- Foam up and shape as usual with the battery pack over the side pin location

## **Outer Shell Lamination**

### **• Lay Up**

- 6 layers of nyglass
- 2 layers of finishing stockinette
- Cut out the battery box but do this with care and precision

## **Assembly**

### **• Trim Lines**

- Cut out and trim socket and shell as normal
- The liner should extend past the trim lines of the socket to provide some comfort for the patient

### **• Finding the Side Pin Locations**

- You will see a tiny bump on the inside of the socket which indicates the center of the side pin rosette
- Using a heated awl, poke through until you see the tip on the outside of the socket
- Drill the hole with a 5/32" drill bit
- With a poking tool at 90°, poke through the hole to make sure it slides in and out without hesitation
- ***NOTE: the 90° tool will ensure an accurate placement of the side pin in the outer shell***
- Heat the outer shell to avoid any stress marks
- Place the socket into the outer shell and temporarily affix them together
- Heat the 90° poking tool and poke through the outer shell for the lateral side pin location
- ***NOTE: for the medial side pin located in the center of the battery box, affix the battery casing before poking a hole through it***
- Place the battery casing and dummy into the designated area and make sure it is snug
- Using masking tape, overlap and surround the battery case to ensure surface is kept clean
- Adhear the battery case by using siegelharz on the inside of the outer shell
- Once that case is secure, use the same poking tool and poke a hole through the battery case

### **• Opening up the Side Pin Holes**

- Using a larger drill bit or spade bit, gradually drill the marked locations so that the suspension pin fits in nicely
- ***NOTE: Drill the hole 1-2mm bigger than the suspension pin head***
- If holes are any bigger, it may cause insufficient suspension.

- **Suspension pin**
  - The suspension pins are long to begin with so if necessary, they can be shortened
  - Gradually grind away unwanted threads and check occasionally
  - **GOAL: to have the suspension pin protrude the inner socket but they do not have to be flush with the outer shell. The suspension pin head provides the locking mechanism so ensure it is doing so**
- **Suspension Pin & Battery**
  - **NOTE: Ensure that the suspension pin located under the battery is NOT protruding through the battery case or the battery will not fit in properly**
  - Finish the prosthesis and attach the terminal device

### **Patient Instructions**

- **Donning the Definitive Liner**
  - Suspension pins are in place
  - Invert the definitive liner
  - Apply *Procomfort Gel* (OB article #633S2) to the skin on the arm
  - Roll on the liner ensuring correct position
  - With the liner on the limb, slide into the socket until the side pins are securely in the designated space
  - Check that the liner is locked in by trying to pull out of the socket
  - Repeat if necessary
  - Patient should feel secure
- **Doffing the Prosthesis**
  - Switch off the hand and take out the battery pack and set aside
  - Using the other hand, depress the suspension pins and pull out the liner once they are depressed
  - This should not hurt the patient since the suspension pins are located on fleshy areas

### **Summary**

- Side Pins – virtually same function as the Distal Pin
- Minimize length for long transradial amputees
- Best location – FLESHY areas (middle third of the forearm towards the distal end)
- Battery box can hide side pins if necessary

**A custom silicone liner with *side pin suspension* is a great alternative to the common distal pin attachment used to secure liners into laminated sockets.**