Al-Mustaqbal University

Collage of Engineering

Prosthetics and Orthotics Engineering

Third Stage

PROSTHETICS II

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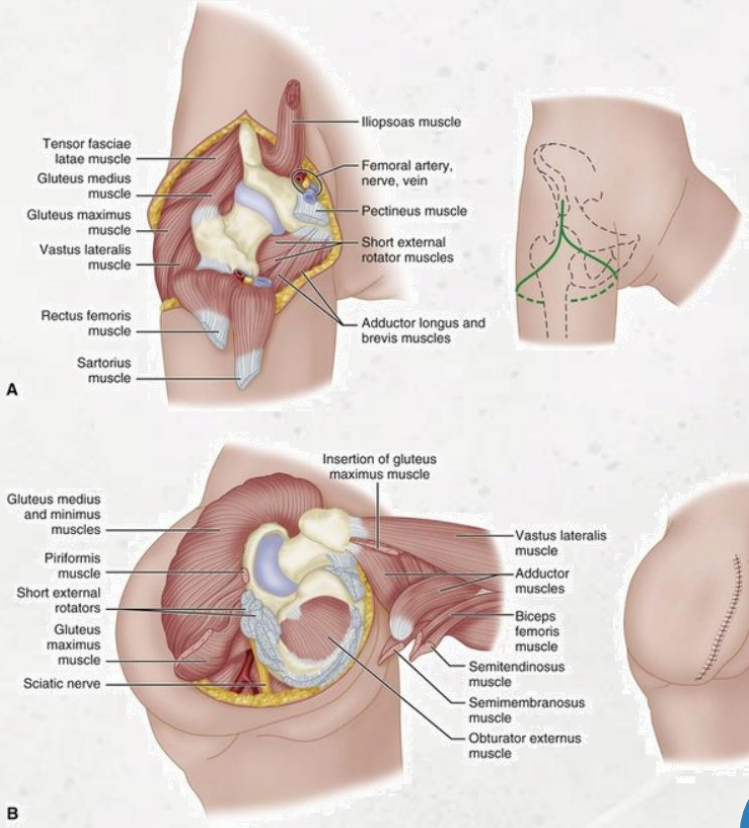

Prosthetic Socket Designs for HD

While the mechanical components may vary, the socket design is critical. All types aim to bear weight through the patient's ischial tuberosity and gluteal muscles.

1. Tilting Table Type: A traditional and bulky design made of a leather or plastic socket that fully encloses the hip. It relies on a pelvic belt for suspension and uses external hip and knee joints.

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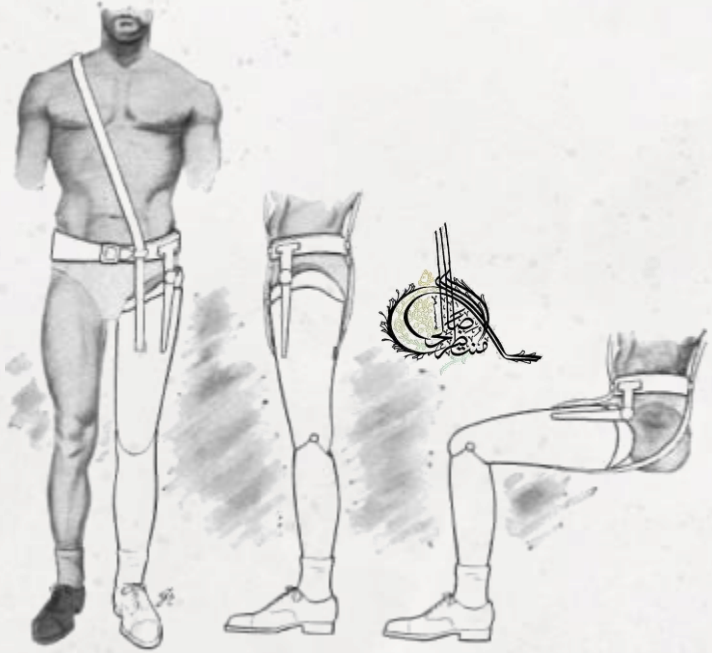
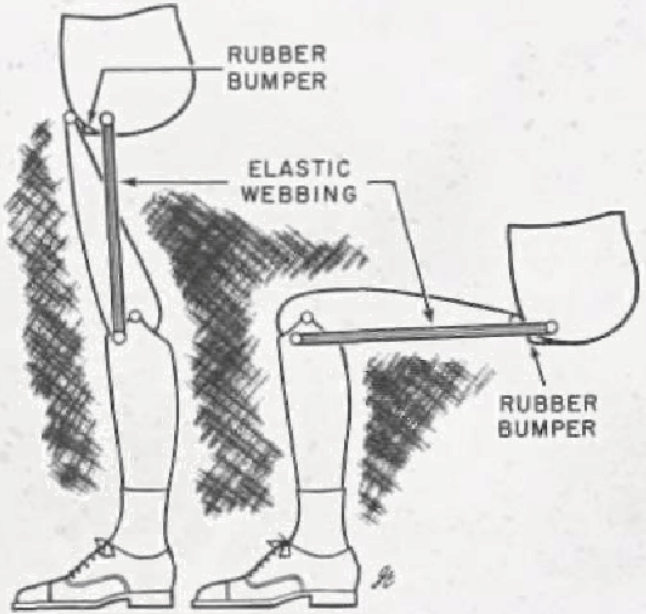
Prosthetic Socket Designs for HD

2. Saucer Type: Features a very shallow, "saucer-like" socket that the ischium and gluteal muscles sit upon. This minimalist design often provides poor stability and allows for unwanted rotation.



Prosthetic Socket Designs for HD

3. Canadian Type: The modern standard, this is an intimate-fit plastic socket that provides superior control. It precisely encloses the ischial tuberosity for weight-bearing and grips the iliac crest (hip bone) for stability during the swing phase of walking.



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Casting Techniques for HD Sockets

1- Total Suspension Casting (Non-Weight-Bearing)

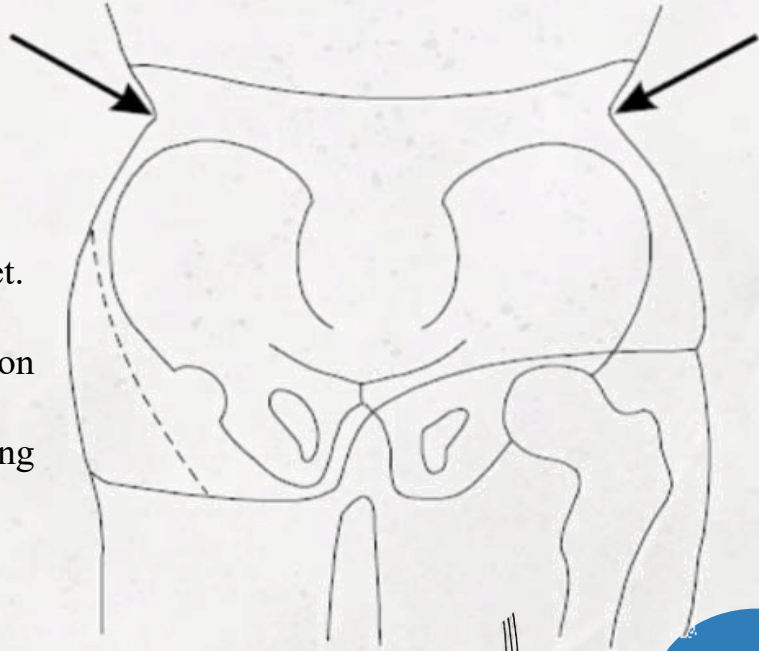
This technique is preferred for patients with more soft tissue and less muscle tone, as it effectively contains the anatomy in a suspended position. However, it can allow tissue to bulge forward, which may complicate the precise placement of the hip joint component later in the process.

Casting Techniques for HD Sockets

2- Casting with Forming Blocks (Weight-Bearing)

For this method, the patient stands with their amputated side between two angled blocks that shape the cast under body weight. The anterior block creates a flat, strategically placed surface on the cast that directly determines the final mounting position for the prosthetic hip joint, ensuring accurate alignment.

Suspension for HD Sockets



1. Anatomical Suspension (Self-Suspending Socket)

- This is the modern standard, primarily used in the Canadian-type socket.
- The socket itself is precisely molded to lock above the iliac crests on both sides. It requires no additional straps for suspension, relying entirely on its intimate anatomical fit to hold the prosthesis in place.

Suspension for HD Sockets

2. Pelvic Belt / Silesian Belt

- A webbing strap that encircles the pelvis, attaching to the socket to provide suspension.
- It offers additional security against rotation and can help patients with less defined bony anatomy or weaker core muscles feel more secure. It is often used as an auxiliary (secondary) suspension method.

Suspension for HD Sockets

3. Shoulder Strap (Suspender)

- A strap that goes over the contralateral (sound side) shoulder, similar to a suspender.
- This method is typically reserved for cases where pelvic suspension is insufficient, such as in some Hemipelvectomy cases or for patients with very large abdomens. While very secure, it can be cumbersome and restrictive.


Thank
you