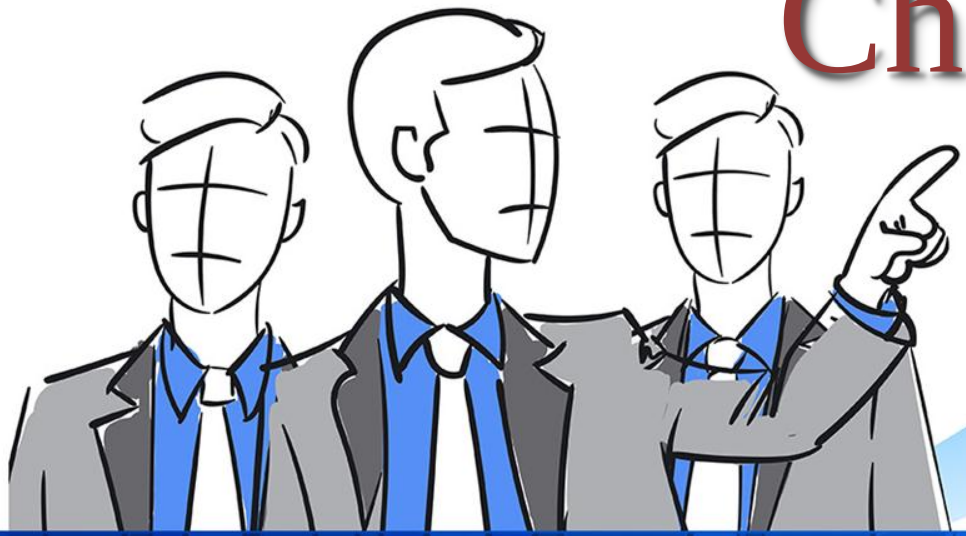


Chapter 9

Prosthetic Problems Discussion

Contents

I. Causes of problems in Partial Foot Amputee
II. Inspection/ Exam of the sole of the foot
III. Prosthetist Considerations

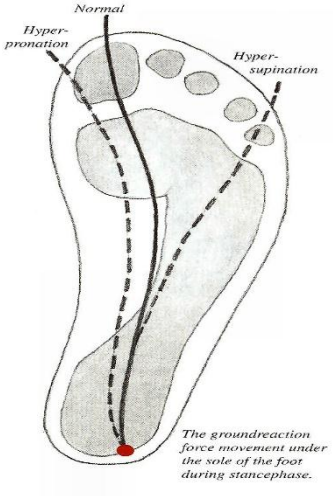
Problems with PF

1. Pain, scars, and deviations with toe amputations can also create significant difficulties for the patient.
2. Check if there are pressure areas
3. Consider socket forces in below ankle and above ankle designs in more proximal amputations

Push off restriction

- With PF amputation it is difficult to reproduce the power created during third rocker at the ankle joint.
- The lever arm, which is represented by the foot blade, is shorter than a normal foot, which results in a less than normal moment.
- The stiffness of the foot-blade cannot be adjusted to accommodate varying levels of activity.
- Running or fast walking for example, requires a much stiffer foot blade than slow walking.

The weight of the patient is also important.



Inspection of the sole of the foot

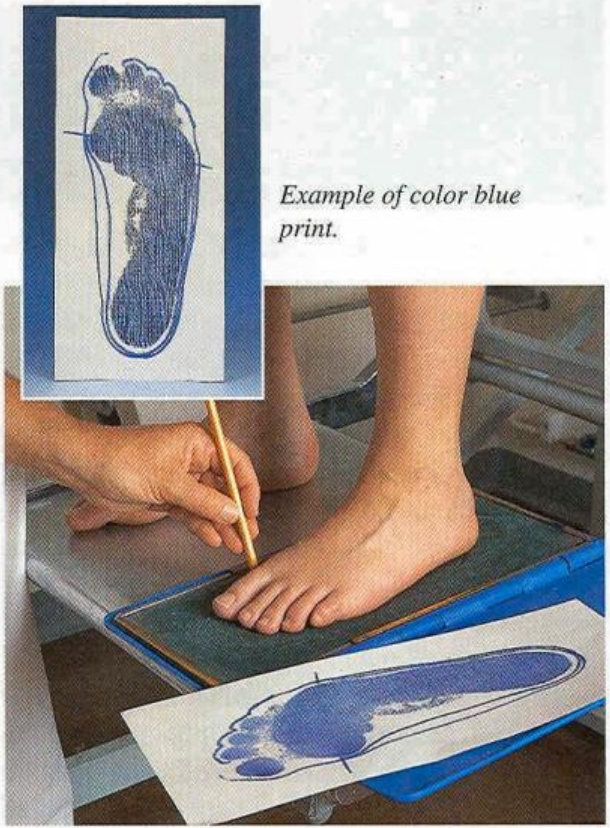
- Careful inspection of the sole of the foot provides information as to the forces acting on the stump. The forces for weight bearing in the prosthetic socket are of particular importance.
- Therefore, every analysis of an established amputee ought to start with a careful examination of the foot-sole.

Examination of sole

There are many methods how to make the examination of the sole and pressure distribution.

Blue print

- A blue print will show the areas of pressure on the stump and the shape of the arch of the foot.
- The blue print does reveal the areas on the stump that are experiencing pressure. It only gives information on static situation at standing, and does not indicate the amount of pressure on the stump.



Example of color blue print.

Mirror box

- A mirror box can also be used to inspect the areas of pressure under the foot during standing.
- The coloration of the skin indicates the differences of the pressure.
- Lighter colors on the sole of the foot indicate high pressure and darker reddish colors indicate low pressure.

Scales

- Using two scales is a very simple method t measure the capability of weight bearing at the distal end of the stump.
- It indicates whether or not the patient applies equal weight on the legs during standing.
- If less weight is put on the amputated side it could indicate an imbalance or pain.

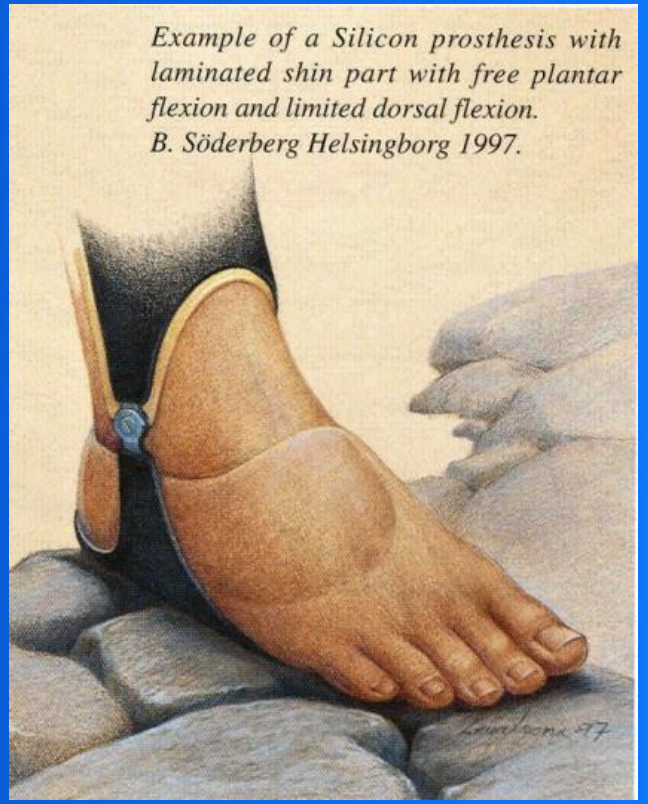
Velocity

- Another simple functional test is to measure the patients' velocity over a specific distance.
- This can be easily measured with a stop watch in a corridor which has been previously measured.
- The normal velocity (speed) for an adult is 1.3-1.6 m/s

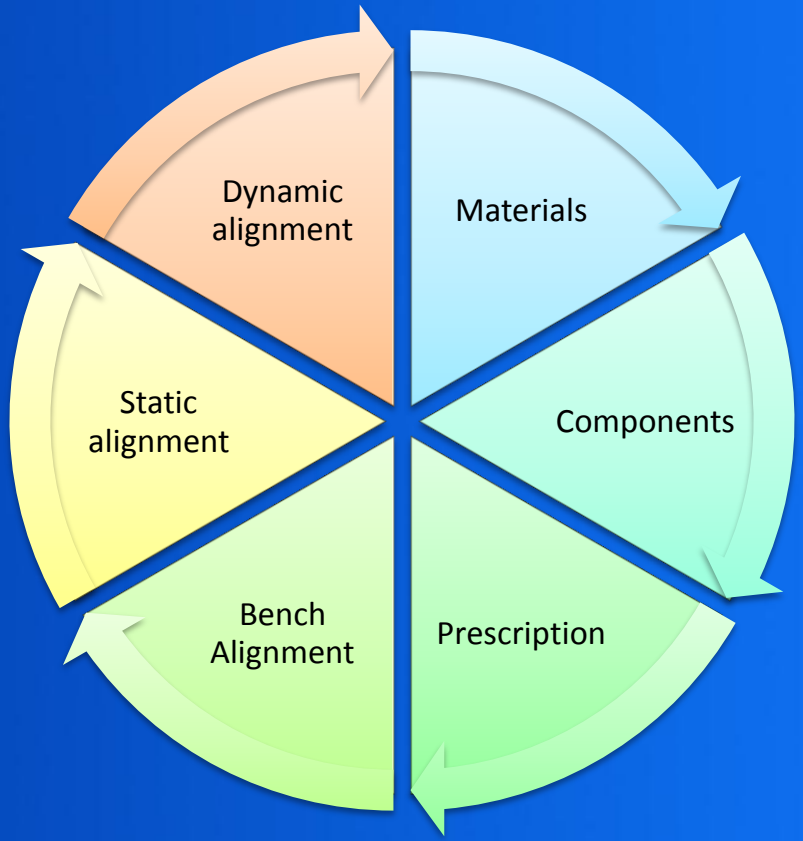
Discussion

- With PF it is difficult to reproduce the power created during third rocker at the ankle joint.
- This could be attributed to the following reasons:
  - The lever arm, which is represented by the foot blade, is shorter than a normal foot.
  - The stiffness of the foot blade can not be adjusted to accommodate varying levels of activity.
  - Running or fast walking for example, requires a much stiffer foot blade than slow walking.
  - The weight of the patient is also important.
  - The inability to actively plantar-flex the foot.

Partial foot prosthesis are very sensitive to different heel heights and the characteristics of the shoe to which the prosthesis is being fitted.



Prosthetics Consideration



Discussion

Bench alignment:

- Coronal view
- Sagittal view
- Transfer view
- Note: Equinus or heel height

Static alignment:

- Stability
- Comfort
- LLD

Dynamic alignment:

- Stability
- Gait deviation

thank you