



Typical Management of BK amputee with 30° flexion contracture followed by femoral neck fracture with 45 mm shaft length shortening and 30° external rotation of knee joint with acute tenderness at hip joint.

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Abstract- Prosthetic management of BK amputee is stereotypic but management with caption significance is really an odd protocol for fitment. In fact it includes two types of irregular variant i.e:- 1- 30 degree of flexion contracture with 30 degree of knee external rotation and 2- neck-shaft fracture with 45mm shortening and unbearable tenderness of same side. Hence in this crucial condition patient is treated with Hip Orthosis to reduce pain followed by reinforcement and BK Prosthesis of 35 degree of flexion angle and same external reduction with 45mm shortening compensation.

Key words-Hip orthosis,Alignment,Mobility,Squaring of hip,LLD Compensation

Introduction-Knee contracture or flexion contracture of the stump is one of the common problems occurred among the below knee amputees. It refers to the situation in which the patient cannot fully straighten the knee or in other words, the range of motion of the joint is limited from normal .As it is a result of the shortening and tightness of the muscles which might be associated with their structural changes due to the long period of bending position or inactivity due to the illness and lack of exercise. But simultaneously the mobility of joint is very important for a prosthetic candidate.

This is because the limitation of joint motion which refers to joint contracture will significantly affect the fitting and function of the prosthesis. For an amputee who is going to proceed with a prosthesis, the presence of stump contracture could be a barrier for him/her to achieve a successful prosthesis usage. This is because the contracture will disrupt the prosthetic alignment that could lead to various kinds of adverse effects while using

the prosthesis. However, the alignment of the prosthesis still can be adjusted to accommodate with the knee flexion contracture if any but if the angle exceeding 25° , the fitting might be difficult. The prosthetic alignment can be defined as the positioning of the socket in relation with the other components of the prosthesis such as ankle joint and shank tube. Generally, good alignment of prosthesis will contribute to an energy efficient and smooth gait pattern. And the amputees with stump contracture, refers to alignment that should be concerned is for sagittal plane.

It is the anteroposterior positioning of the socket with regard to the foot. The socket flexion will be increased respectively with the contracture angle which means the alignment is deviating from the standard. Otherwise, the amputee will exhibit gait deviations during walking such as rough rollover of the foot and inconsistent heel strike. In rehabilitation process, stump contracture is one of the major inhibitors for an amputee to acquire a prosthesis. It has been found that 10° is the maximum amount of stump contracture for the amputee to possess a great walking ability. With the degree more than that, it could lead to the failure of the prosthesis usage for mobility. Even still can be used, there will be a lot of factors that need to be reconsidered while making the prosthesis such as alignment and components.

Case study-

- A BK amputee of age 50 with 30 degree flexion contracture at knee joint followed by nonunion femoral fracture and 45 mm femoral shaft length shortening. The patient is walking with auxillary crutch. Without prosthetic walking. Other relevant issues are normal



Image study/chief complain

- Non united femoral neck since 2 year
- Shortening of 45 mm femoral shaft length
- T/T STUMP with 30 degree flexion contracture.
- Lumbar pain with non squaring of the hip joint



(x-ray of pelvis)

Aim & destination

- Squaring of hip joint through hip orthosis with coxa receptacle.
- Reduce pain at lumbar region by minimizing lumbar lordosis
- Preventive support around non union area for optimal stability.
- Create appropriate force system for forward propulsion .
- Compensation of LLD by adding suitable compensation in TT AXIS.
- Accommodation of flexion contracture of 30 degree by less 5 degree.
- Create gentle pressure over patellar retinaculum for reduction of torque over quadriceps

Fitting technology

- Creation of coxa receptacle hip orthosis helps the patient for squaring followed by reduction of pain at lumbar & non united fracture area.
- Accommodate flexion angle during mounting



METHOD

- 1st phase:- Preparation of hip orthosis. Hip orthosis is made out of polypropylene with single axis mechanical hip joint constructed by coxa receptacle and thigh support.
- 2nd phase:- Formation of BK prosthesis with (amount of flexion contracture + 5 degree) i.e:- 35 degree of flexion related to alignment method along with replication of external rotation by knee joint.



RESULTS

Satisfactory pertaining to VO₂

- VO₂ with crutch walking-104
- VO₂ with prosthesis-97
- The comparison shows the energy consumption is decreased with prosthetic fitment.
- Independency:- The independency level is raised with high self confident and selfesteemed.

DISCUSSION & CONCLUSION

The management of above patient is

1- Set with a new protocol is how hip orthosis can help to reduce the tenderness, instability and confidence in accordance of prosthetic management.

2- The prosthetic system is formulated under reformed kinetics of the body. Hence in fact the reformed kinetics is maintained for the virtue of approximate walking with new variation on kinematics.

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