For scientific study or technical contribution

Title: Osseointegrated reconstruction in patients with congenital Lower limb Deformities

Summary*:
Osseointegrated reconstruction could be an option for patients with congenital deformaties who have poor socket exprience, as it has shown to improve quality of life despite minor mobility gains and complications.

Background*:
Congenital deformities of the lower limbs affect patient's mobility and quality of life. Amputation of the non-functional limb and osseointegrated reconstruction of amputated limbs has recently emerged as a novel approach to improve patient's mobility and quality of life. Our aim was to study the outcomes following osseointegrated reconstruction in patients with congenital deformities of the lower limbs in a specialized international osseointegration centre.

material, method; Implementation, process:
Data was collected prospectively for osseointegrated reconstruction surgeries performed by the same surgeon between 2012 and 2022 for 14 patients (7 female and 7 male) following amputations for congenital lower limb deformities. Demographics details, length of follow-up, Causes of deformity, amputation level, post-operative complications and outcomes were recorded using SF-36 Health Survey, Questionnaire for Persons with a Transfemoral Amputation (Q-TFA) which included Prosthetic Use Score (Use), Prosthetic Mobility Score (Mobility), Problem Score (Problem), and Global Score (Global), Time up and go (TUG) test and 6 minutes' walk test.

Results:
The mean age was 46 years (range 20-78). The level of amputation was transfemoral in 6 patients and transtibial in 8 patients. The average length of follow up was 5.7 years (range 2.1 – 10.8 years). The preoperative diagnosis was polio in 3 patients, blood clot in infancy in 3 patients, failed treatment of club foot surgery in 2 patients and proximal focal femoral deficiency (PFFD), Fibular hemimelia, hemihypertrophy, spina bifida, Unreconstructable deformity and Significant valgus recurvatum tibial deformity in one patient each. Post-operative complications included aseptic loosening in 1 patient with PFFD, 18 months following the Osseointegration surgery for transfemoral amputation which needed revision and 5 years following revision surgery patient does not report any further complications. One patient with transtibial amputation for failed surgical treatment of club foot had implant fracture after 8 months. Four patients required washout for infection where 2 patients had more than 1 washout event (total of 7 events), two patients required neurectomy procedure for pain management and four patients chose to have stump refashioning for aesthetic purposes. All patients were doing well at the last follow up.

SF-36 average physical component score was 32.9 pre-op and 37.8 post op and average mental component score improved from 49.0 pre op to 54.5 post op. Average Q-TFA global score improved from 58.5 pre-op to 75.4 post op. Average prosthetic score improved from 66.9 pre op to 78.9 post op. Average mobility score was 64.6 pre-op and 60.9 post op and average problem score did not improve much from 20.2 pre-op to 22.4 post op. Average Time up and go test was 10.17 seconds pre

op and 11.52 seconds post op and average 6 minute walk test remained unchanged from 362.5 meters to 365.6 meters.

discussion/conclusion; Conclusion for practice*:
We presented the results of 14 osseointegrated lower limb reconstructions for congenital deformities. There were 9 total complications events (7 infections, one fracture and one aseptic loosening). There was improvement in mental and physical component of SF 36. Q-TFA improved in global and prosthetic use domains. However, the QTFA mobility, and problem scores did not change significantly, along with 6 minutes' walk test when compared with pre-op mobility with orthotics and walking aids. The use of osseointegration in selected patients with congenital lower limb deformities can be a viable option to improve their quality of life and functional outcomes for those individual who have poor outcomes with traditional socket prosthesis.