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Immediate Post Operative Prosthesis (IPOP) in Transfemoral Amputees Following Trauma: An Author's Illustration

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Amputation isone of the major causes of locomotor impairment in various developing nations including India.The various reasons for amputation are trauma, peripheral vascular disease, neoplasms, infections, and congenital defects.[1]The physical, psychological, and social challenges that come with losing a limb have a significant impact on an individual's quality of life and overall health, necessitating the development of novel ways of coping for day-to-day activities and adjusting to societal changes.[2]

In the course of a year, from January 2023 to December 2023, 215patients underwent major amputations of the total admissions which is 1669 in trauma surgery and critical care at level-I trauma centre. 183 of these patients underwent amputation of lower limb. Among them, 100 (46.5%) patients were transfemoral amputation.

After a transfemoral amputation, the conventional method is to apply soft compressive bandages to the stump to encourage healing and lessen swelling.This method requires a long period of restricted mobility, which exposes patient at risk for joint stiffness and falls causing injury to the stump, muscular weakness, and body deconditioning.[3]Immediate post operative prosthesis (IPOP) is an adjustable, custom fabricated, removable prosthesis that protects the incision site, reduces swelling, decreases pain and allows regular inspection of the residual limb.Patients who wear an IPOP begin to walk the very first day following surgery, show a positive physiological and psychological effects.[4]Stump healing is facilitated by the initiation of prosthetic application and early rehabilitation after surgery in the operating room. In our protocol for transfemoral amputees, mobilization with crutches or a walker on a temporary prosthesis was accomplished and walker-assisted mobilization encouraged. This resultedin evident psychological benefits as well as the improvement in stump size, muscular strength, and cardiovascular fitness, along with minimization of contracture development.[5]This approach is not new. The use of IPOP was initially documented in 1893 by Von Bier, a German surgeon who claimed that a rigid plaster cast with wooden peg legs attached could accelerate recovery after amputation.[6] Wilson also reported outstanding results in 1918 in the treatment of young, traumatic amputees during World War I.[7]Berlemont and Wiess (1957) reported that transtibial amputees could effectively use a thigh cast that was immediately linked to a below-knee

prosthesis.[8]IPOP has not been utilized much for amputation rehabilitation following trauma. The reasons for this could be attributed to various factors, including unfamiliarity with the IPOP technique, reluctance to enable weight bearing on a new stump, and lack of resources to support follow-up and stump care routine after IPOP application.

Following amputation, postural control is impaired in patients, mostly as a result of reduced range of motion in the prosthetic foot and loss of sensory feedback and muscular control in the amputated leg.[9] The reduced use of the prosthetic leg compared to the intact leg is one of the most evident compensatory and adaptive postural control strategies in lower limb amputees. The changed biomechanics of the intact non-amputated limb, pelvis, and trunk compensate for the reduced use of the prosthetic leg for posture control. This could make it more likely that pain symptoms and secondary overuse musculoskeletal injuries, which limit functional mobility and have a reasonably high prevalence in amputees of lower limbs, will manifest.[10]

In addition, individuals who lose limbs experience severe psychological impacts that worsen their quality of life. A traumatic amputation limits a patient's everyday activities and work, which has a substantial negative impact on their psychological well-being. The literature indicates that between 13% and 32% of patients who have had limbs amputated experience significant depression symptoms.[11] It is speculated that the use of IPOP aid towards achieving psychological stability and alleviate mental stress following amputation given that it allows early weight bearing and facilitate ambulation after surgery and aesthetically satisfy patient for missing body part.

Ali and colleagues conducted a comparison between IPOP and soft postoperative dressings and discovered comparable rates of complications in transtibial amputees. They suggested that the IPOP may have some psychologic advantages for the patient along with early ambulation.[12] On the other hand, in contrast to Ali's findings, Samuelsen and colleagues found no significant correlations between the level of activity that was actually recorded and the expected level of function in patients with transtibial amputation.[13]

Therefore, there is insufficient data available to evaluate how an IPOP impacts psychological stability and quality of life after a transfemoral amputation. So, authors believe that, to close the efficacy gap between IPOP and traditional prosthesis, additional researches are necessary to ascertain IPOP's effectiveness in rehabilitation of transfemoral amputation following trauma.

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