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Case Study

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A CASE REPORT ON LOWER LIMB AMPUTATION

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ABSTRACT

Lower limb amputation is a significant yet preventable disability and public health issue. It is associated with profound economic, social, and psychological effects on patients and their families. An estimated 10% of the global population experiences some form of disability or impairment. A case study about a 10-year-old boy who underwent amputation surgery for his congenital clubfoot to improve his gait pattern. The surgery was successful, and he now has a better gait pattern with no issues in other joints.

KEYWORDS: Lower limb, Paediatric limb deficiency, Transtibial amputation, Club foot

INTRODUCTION

Lower limb amputation is a significant yet preventable disability and public health issue. It has associated with profound economic, social, and psychological effects on patients and their families. An estimated 10% of the global population experiences some form of disability or impairment.

The term “disability” has various definitions. The World Health Organization (WHO), in its article on the Global Burden of Disease, describes disability as a loss of health in terms of functional capacity, such as mobility, cognition, hearing, and vision. The number of people with disabilities is increasing due to several factors, including population growth, emerging chronic diseases, aging, and advancements in the medical field. These factors contribute to longer life expectancy and an increasing demand for healthcare and rehabilitation services.[1]

The prevalence of disability in South-East Asia ranges from 1.5% to 21.3%. However, data on disability, particularly in the North Indian context, remain limited.

Among the various causes of disability, amputation is one of the leading contributors. It is also one of the oldest surgical procedures. With industrialization, especially the rise of mechanical transport the number of amputees has increased.[2]

Lambert and Siora, in their 1958 study on the causes of amputation among young men in Illinois, USA, found that trauma was the most common cause, accounting for 52% of all amputations. Later, Stewart and Jain reported that in Scotland, UK, the majority of amputations were caused by peripheral vascular disease, particularly arteriosclerosis.[3]

Thus, we can conclude that in developed countries, peripheral vascular disease has replaced trauma as the most common cause of amputation.

While in the developing countries, it appears that the trauma is the leading cause. A 5-year study from Nigeria (2005) revealed that 76% of the 71 amputations performed were due to trauma.[4] Another study from Thailand University (2005) revealed that dysvascular causes like atherosclerosis accounted for 46% of the 188 amputations.[5] Studies from India suggest that indications for amputation vary by region. A study by Pooja and Sangeeta from Kolkata found that among 155 amputees, trauma was the most common cause, accounting for 70.3%, followed by peripheral vascular diseases. Another study from Kerala (2017) found that among the 81 amputations performed over an 18-month period, 39.5% were due to diabetes-related complications. Similarly, a study from South India (2018) found that diabetes accounted for 82% of the 243 lower limb amputations performed. Psychiatric aspects

related to amputations are an evolving topic. Studies report that post-traumatic stress disorder (PTSD) among amputees ranges from 3.3% to 56.3%, while generalized anxiety disorder rates ranged from 3.4% to 10[6]%.

CASE REPORT

Ayush is a 10-year-old boy who lives in a children's home designed for disabled children but attends a regular public school. He was born with Spina Bifida, most likely in the form of Aperta Meningocele, as indicated by his conditions: a paralyzed left lower leg, a left club foot, and incontinence. His detailed medical history from birth is unknown at the children's home. However, it is known that he underwent surgery after birth to remove a sensitive fluid-filled bulge on his back. This area remains sensitive to this day.

There is little communication between Ayush's parents and the children's home, as his parents do not wish to stay in contact. He was abandoned after his disability became apparent. Despite this, Ayush is very happy at the children's home and does not want to leave, referring to it as his new family. He is a very chatty boy who, despite struggling to keep up with his friends while running, still tries and wants to participate.

Ayush's left foot was amputated due to his disturbed gait and additional complications, such as issues with his left knee and hip. The operation was postponed for a long time because parental consent was required. After months, if not years of efforts, his parents finally gave their permission for the amputation.

The primary goal of the amputation was to increase Ayush's independence. He had difficulty walking and running due to his club foot and suffered from frequent pressure sores. He also struggled to wear shoes and climb stairs. Due to his imbalance, he fell often but could stand up independently.

Additionally, Ayush experiences incontinence and has to wear a diaper throughout the day. This condition affects his daily life, he has adapted well and knows how to change his diapers and maintain good hygiene.

His altered gait pattern led to problems with his knee, hip, and back. A transtibial amputation was considered a solution to these issues, as well as to his original gait difficulties caused by the club foot. With a prosthesis, he would be able to walk with a more natural gait pattern.

Before the operation, when the future was still uncertain, rehabilitation efforts focused on training Ayush's balance on his right leg. His right leg was strengthened for balance and endurance, along with targeted exercises for the left knee and hip. Core stability training was also incorporated to enhance his overall stability.

After the amputation, Ayush had to wait a short while before his prosthesis was ready. During this time, training continued focusing on balance and strength in his right leg, as well as strengthening his left knee and hip. By the time he received his prosthesis, he already knew how to put it on, as he had been living with other children who also used prostheses. One of his best friends at the children's home also had a transtibial prosthesis, and Ayush had previously helped him put it on. After a few demonstrations, he quickly learned to do it by himself.

Initially, due to pressure spots, he had to wear the prosthesis for one hour on, one hour off. Over time, he became accustomed to wearing it full-time. At first, he used a walker both indoors and outdoors. Once he gained confidence walking indoors, he continued using the walker for the long, unstable walk to school. Eventually, he was able to walk without it.

Now, Ayush has a well-functioning prosthesis and no longer experiences problems with his knees or hips. While his gait is still somewhat altered, it has significantly improved compared to before the surgery. The walker was beneficial in the beginning, allowing him to attend school even when he wasn't wearing his prosthesis.

The training on his right leg proved essential, particularly with the walker, as it helped him start standing and walking on his own. Strengthening his left knee and hip beforehand also made it easier for him to transition to using the prosthesis.

His stump wounds healed slowly but are now fully recovered. He is accustomed to using his prosthesis, knows how to put it on properly, and can clean it himself. He also performs exercises independently. Occasionally, he still trains in the physiotherapy room to ensure that everything continues to function well.

DISCUSSION

Ayush's case highlights several important aspects of rehabilitation, medical decision-making, and social integration for children with disabilities. His journey underscores the significance of early intervention, persistence in obtaining parental consent for necessary medical procedures, and the role of rehabilitation in improving mobility and independence.

- **Medical and Rehabilitation Considerations**
- Ayush's initial condition—Spina Bifida with a left club foot and incontinence posed significant challenges to his mobility and daily activities. The amputation of his left foot was ultimately necessary due to gait disturbances, pressure sores, and secondary joint problems.
- The rehabilitation approach, which prioritized strengthening his right leg, improving balance, and enhancing core stability before and after the surgery, played a crucial role in his successful adaptation to the prosthesis.

- The gradual introduction of the prosthesis, starting with short wear times due to pressure spots, was a well-managed transition that ensured proper adaptation.[7]

- **Psychosocial and Emotional Well-being**
- Despite being abandoned by his parents, Ayush has found a sense of belonging in the children's home. His emotional resilience and ability to integrate socially are commendable.
- His eagerness to participate in physical activities, despite his mobility challenges, reflects a strong determination and a positive outlook.
- The presence of other children with similar conditions in the home has likely played a crucial role in his acceptance of his prosthesis and overall rehabilitation success.[8]

- **Challenges and Future Considerations**
- While his gait has improved with the prosthesis, it remains altered. Continued physiotherapy and possible prosthetic adjustments may be necessary as he grows.
- His incontinence remains a daily challenge, though he has adapted well to managing his hygiene. Future interventions, such as bladder training or medical management, could be explored to improve his quality of life.
- As Ayush grows older, further monitoring will be needed to assess any emerging orthopedic complications related to his spinal condition.[9]

Overall, Ayush's progress is a testament to the effectiveness of a structured rehabilitation program and the impact of a supportive environment. His case highlights the importance of individualized care, persistence in obtaining medical approvals, and fostering emotional well-being in children with disabilities.

CONCLUSION

Ayush has shown remarkable progress in adapting to life after his trans-tibial amputation. Despite the initial challenges, including parental consent delays and post-surgery adjustments, he has successfully transitioned to using his prosthesis. His independence has significantly improved—he can walk without a walker, maintain hygiene, and manage his prosthesis effectively. Training focused on strengthening his right leg, core stability, and overall endurance has contributed to his ability to move more freely. Although his gait remains slightly altered, it has improved compared to before the surgery, and his previous joint issues have been alleviated.

Ayush's resilience, determination, and supportive environment at the children's home have played a crucial role in his progress. He continues to train occasionally to maintain his mobility and independence. His story highlights the importance of early intervention, structured rehabilitation, and a strong support system in enhancing the quality of life for children with disabilities.

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