

IMPACT OF PHYSIOTHERAPY IN SEVERE GENU VALGUM: A CASE STUDY

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ABSTRACT-

Genu valgum is one of the lower extremity malformations in the coronal plane (knocked knees). It is possible that children will be affected as well. It may also be inherited, with females being more prone to developing it. A 14-year-old female patient presented with significant genu valgum abnormalities in both lower extremities. The patient is in discomfort, unable to stand, and must sit on the ground. The intensity of pain was scored as 8/10 during activity and 5/10 during rest on the numerical pain rating scale (NPRS).

The patient had six weeks of physiotherapy treatment, which included exercises, electrotherapy, and gait training. As a result, the patient's discomfort was reduced to 2/10 while active and 1/10 while resting and his range of motion and functional activities improved. Physiotherapy has a substantial impact on correcting gait, improving quality of life, and recovering functional ability. According to the current case study, conventional physical treatment gradually and dramatically improved functional goals, perhaps assisting in a successful recovery.

INTRODUCTION-

The knee is one of the largest and most complex joints in the human body. The knee joins the tibia (shin bone) to the femur (proximal end of the thigh bone) [1]. The most common manifestation of Genu valgum is a knock-knee [2]. One of the lower extremity anomalies in the coronal plane (knocked knees) is genu valgum [3].

Idiopathy is the most common cause of genu valgum. However, genu valgum is widespread in underdeveloped and third-world countries [1]. Rapid physical therapy results in the achievement of functional goals. When the legs are straightened, the knees in genu valgum (knock-knee) bend towards the midline of the body and make contact [4].

Genu valgum is a cosmetic abnormality that can alter gait by hitting knees repeatedly when jogging. It changes the Q angle and raises the risk of patellar dislocation. Weight-bearing shifts to the medial side of the foot, resulting in the appearance of a flat foot and the need for frequent footwear change [5]. In addition to being unable to move or sit up, the patient was in excruciating pain. The gait pattern was influenced by knee-knocking, a lack of foot space, and a pre-swing phase [6].

Early physical therapy results in the achievement of functional goals. In these cases, physiotherapy is largely concerned with addressing the deformity. The patient received physiotherapy for six weeks, which included exercises, electrotherapy, and gait training. As a result, the patient's pain, range of motion, and functional activity improved.

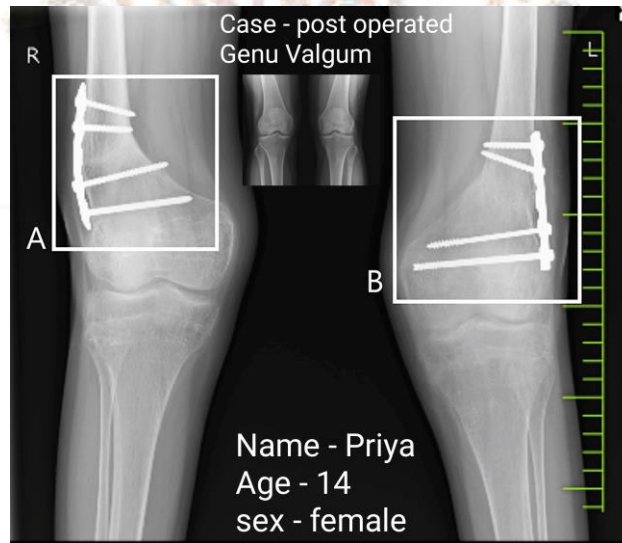
CASE PRESENTION-

A 14-year-old girl arrived with significant genu valgum abnormalities of both lower extremities, as well as an uncoordinated walk. Three years ago, after consulting with an orthopaedic specialist, the patient had supracondylar osteotomy of the right femur with plate fixation. In March 2022, the patient underwent additional surgical treatment of the left lower leg, which included a lateral wedge osteotomy followed by hip spica cast application for 1.5 months. Following that, the patient began physiotherapy.

RADIOLOGICAL FINDINGS-

ON INSPECTION-

A complete medical examination was undertaken after obtaining the patient's parents' full agreement (Figure 1). The patient was evaluated both supine and standing. The patient's demeanour was cautious. The hip and knee joints were flexed to 70 degrees. The right knee joint had diffuse oedema. The skin looks to be tight and glossy. Healed surgical scars ran from the distal thigh to the patella, as seen in the prior surgery. Muscle wasting could be noticed on both the right and left thigh. The degree of pain was scored as 8/10 when exercising and 5/10 while resting on the numerical pain rating scale (NPRS).



ON PALPATION-

Inspection findings were confirmed by palpation. The temperature was average. Over the joint line, there was grade 2 discomfort. The patient cannot extend her left leg. There was pulse in the dorsalis pedis and the posterior tibial artery. The muscles and ligaments in both upper limbs had no soft tissue stiffness. During the lower limb soft tissue tightness evaluation, severe posterior knee capsule tightness in the right knee was identified by actively executing a range of motion or providing resistance. The evaluation of manual muscle testing reveals limitations in normal functional activity.

MANUAL MUSCLE TESTING-

The muscular strength of the bilateral upper limbs was determined to be 4/5 on the standard grading scale. The bilateral lower limb strength was found to be 3+/5 on an Oxford grading scale for muscular strength.

RANGE OF MOTION-

Both upper limbs had a complete and pain-free range of motion at the shoulder, elbow, wrist, hand, and fingers. Tables 1 and 2 illustrate the range of motion for the lower limbs before and after rehabilitation.

Joint	Movement	Right	Left
Hip	Flexion	0-100	0-90
	Extension	0-10	0-10
Knee	Flexion	0-100	0-120
	Extension	100-0	110-0
Ankle	Dorsiflexion	0-25	0-25
	Plantarflexion	0-20	0-20

Table 1: pre-rehabilitation range of motion

Joint	Movement	Right	Left
Hip	Flexion	0-125	0-125
	Extension	0-15	0-12
Knee	Flexion	0-125	0-130
	Extension	125-0	130-0
Ankle	Dorsiflexion	0-10	0-10
	Plantarflexion	0-45	0-45

Table 2: post-rehabilitation range of motion

PHYSIOTHERAPY MANAGEMENT-

On the first day of treatment, we measured the patient's strength, range of motion, tightness, and discomfort. Before beginning therapy, the patient was given information regarding the surgical technique. The patient has stressed the importance of exercise in his quick return to ADLs and enhanced rehabilitation. The patient was offered gait training and ergonomic guidance, which included posture adjustment. Table 3 contains more management.

Phase	Physiotherapy regimen
Phase 1 immediate post-operative (3-5 days)	To alleviate pain, use an electrotherapeutic modality in conjunction with relaxation training. Cryotherapy is used to alleviate inflammation. To minimise oedema, use quick quadricep settings or electrical stimulation under a pressure bandage with limb elevation, as well as resistive ankle, foot, and SLR movements. Maintain a frequent isolated quadriceps setting withhold for 6-10 seconds to prevent reflex inhibition. Supported relaxed knee passive swinging with the typical collateral leg in a small range.
Phase 2 early healing (5-15 days)	Gradual but definite progression of early measures in phase 1 in conjunction with a knee ratchet pedocycle or static exercise programme Weight shifts Ambulatory support or full weight-bearing The ROM of the knee should be around 120 degrees.
Phase 3 late healing (15-21 days)	A high-intensity progressive quadriceps exercise supported and guided functional positions. Squatting on the floor, cross-leg sitting, and prone heel sitting (kneeling). Standing on the injured limb alone, ambulation unaided or with minor help, but no limp. The ROM of the knee should be around 120 degrees.
Phase 4 conditioning (3-5 weeks)	High sitting, quick isotonic full range of motion, and relaxed knee swinging. Quadriceps resistance exercises that progress. Proprioception is enhanced by balance activities. Gait improvement. Return to your workplace.
Phase 5 functional progression (6 weeks onwards)	Running with your hands on the wall bars. Jogging in a straight line. Running in a straight line. Hopping in a straight line. Drills for agility (for example, figure-of-eight running). Return to sports gradually.

Table 3: physiotherapy management

DISCUSSION-

Genu valgum is a frequent orthopaedic problem in children [7]. The bulk of these people visit the hospital for cosmetic reasons. The vast majority of these Physiological Genu Varum and Physiological Genu Valgum patients proceed through the regular developmental stages [6]. It is possible that it is hereditary, with a higher occurrence in females. Many procedures have been shown to be beneficial, but they are also coupled with physiotherapy management, which focuses on rehabilitation [8].

Electrical modalities with cryotherapy, stretching, mobilisation, strengthening, and open and close chain exercises are the typical treatments for these individuals. Interferential treatment, transcutaneous electrical nerve stimulation, and ultrasound are examples of electrical methods. The aims of physiotherapy treatment are determined by the patient's primary ailment as well as the correction of deformities.

Various manual therapy techniques are also utilised to address deformities, and muscle strength is maintained by strengthening a specific group of muscles. While some muscles appear to tighten throughout time, others degenerate. As a result, the characteristic of each muscle is determined and treated accordingly. It considerably aids in pain control, which leads to increased patient confidence. The primary goal of the physical therapy intervention was to increase range of motion while also keeping the muscles strong and healthy for walking.

Cryotherapy has greatly reduced pain, enabling patients to exert greater effort [9]. In both developed and developing countries, nutritional rickets and trauma are the leading causes of genu valgum deformity [10]. Persistent genu valgum causes an uneven gait, functional problems, early onset of arthritis, anterior knee soreness, patellar maltracking leading to patella-femoral dislocation, and difficulty running [11]. Various distal femoral osteotomies for the correction of valgus alignment in late adolescents and young adults have been recorded in the literature. The goal of therapy is to correct limb alignment and prevent additional joint degeneration.

CONCLUSIONS-

Early detection of the malformation and provision of appropriate therapy is required. Physiotherapy is effective in correcting gait and enhancing quality of life and functional abilities. According to the case study, traditional and timely structural physical rehabilitation led to progressively and considerably improved functional goals, which resulted in a successful recovery. During the intervention phase, the patient cooperated greatly, and the subject is now able to walk with the use of a walker. The case study found that traditional and rapid structural physical rehabilitation improved gait and quality of life.

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