

DYNAMIC KNEE-ELBOW SPLINT

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Post-traumatic and post-surgical stiffness of any joint, more so of knee and elbow joint, is a common problem encountered in Orthopaedic practice. A simple, versatile, economical and easy to use splint has been designed for early mobilisation of elbow and knee joint so as to prevent and treat stiffness of these Joints.

Stiffness of any joint is commonly encountered in any Orthopaedic practice, arising from a variety of causes. The problem is more pronounced in elbow and knee joints due to its peculiar functional anatomy. Treatment is often difficult and prolonged and methods range from corrective manipulations under anaesthesia, skin and skeletal tractions, to surgical corrections followed by early mobilisation of the joint, using sophisticated and expensive continuous passive motion (C.P.M.) devices or cheap and simple, yet cumbersome and not so effective splints such as Pearson knee flexion attachment, Fisk Splint, Tulloch Brown Tibia U-loop, etc.

The Orthopaedic Surgery Department of Goa Medical College has designed a simple dynamic splint which can be used to prevent and treat knee and elbow stiffness. The simple construction makes the splint easily reproducible by any orthotic workshop, cheap, easy to use and allows the patient to be ambulatory during treatment. The splint can be used both in children as well as in adults.

The splint is made of aluminium and consists of two portions—a mainframe (Fig 1-A) and the other movable attachment (Fig 1-B) which is dynamised with a pair of springs. The main frame has a padded gutter, with cloth corset and straps with Velcro Fastner which accommodates the upper arm or thigh. The gutter has a 'U' shaped curved extension which is straight up to the joint it encompasses and then turned towards recurvatum position to achieve the dynamic extension. Free mechanical joint is provided at the level of anatomical joint with a padded gutter and corset at the end of extension to hold the distal portion of the limb. This is attached to the 'U' shaped band with the aid of pair of springs on either side to achieve necessary extensions and flexion against resistance. Number of holes are provided on the band 'A' so as to enable to adjust the length of spring and to provide required tension.

It is thus that the movements obtained are active and not passive as opposed to the other available splints and devices. This not only prevents muscle wasting but aids in muscle build up

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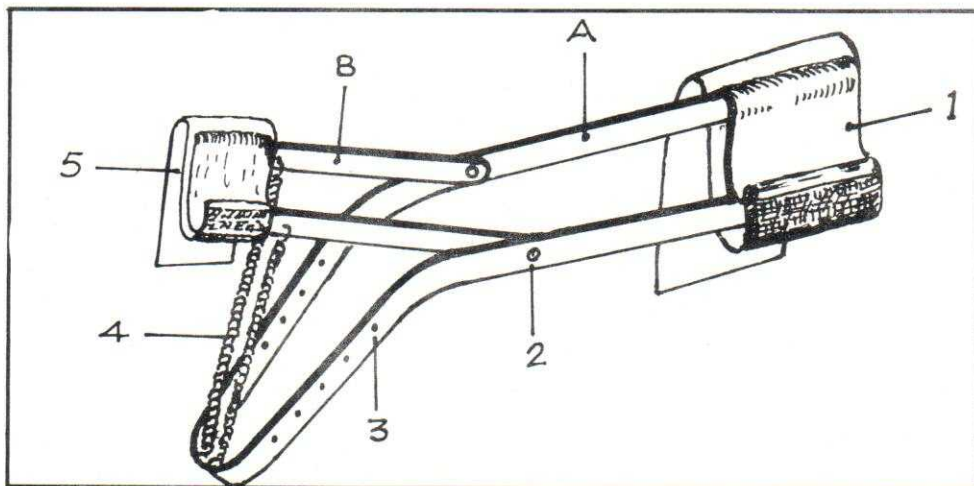


Fig 1: Diagrammatic Illustration of Dynamic Knee-Elbow Splint.
 A- Main Frame, B- Mobile Attachment,
 1- Upper Arm / Thigh Gutter, 2- Mechanical Joint,
 3- Holes for Spring adjustment, 4- Springs,
 5- Gutter for Distal Part.

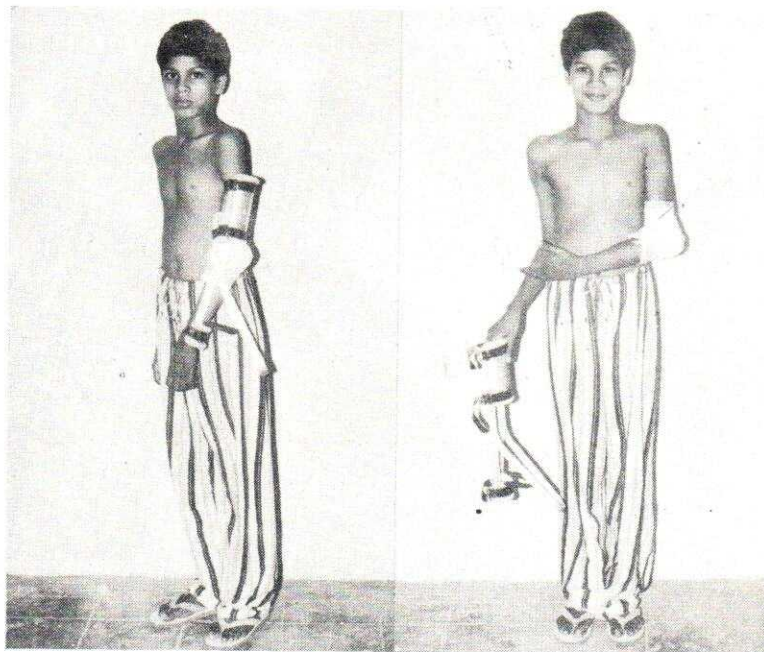


Fig. 2: Splint in use following Elbow Surgery

This splint has been extensively used with encouraging results for the following conditions in Goa Medical College.

Elbow: -Post-traumatic stiffness. Intra-articular fractures (both conservative and surgical management), myositis ossificans traumatica. During active management of burns and after surgical release of burns contracture, arthrolysis, excision arthroplasty, synovectomy in rheumatoid and tubercular arthritis, release of triceps contractures, after arthrotomy in septic arthritis of elbow joint.

Knee: Post-traumatic stiffness. Intra-articular fractures (conservative as well as surgical). Active management of burns and after surgical correction of burns contractures, synovectomy in rheumatoid

arthritis, tubercular arthritis, synovial osteochondromatosis and other similar condition, release of quadriceps contractures, recurrent dislocation of Patella.

Conclusion:

A new useful dynamic splint designed in this Institution has been presented which can be used for both the elbow and knee Joint. It is easy to manufacture, economical, light weight, versatile and easy to use and has indication for use in variety of conditions not only to prevent stiffness of Joint but also to treat the same. Patient is ambulatory. The splint works on dynamic principle and hence helps to build up the muscle tone. Thus it has advantage over many of the conventional splints and devices.

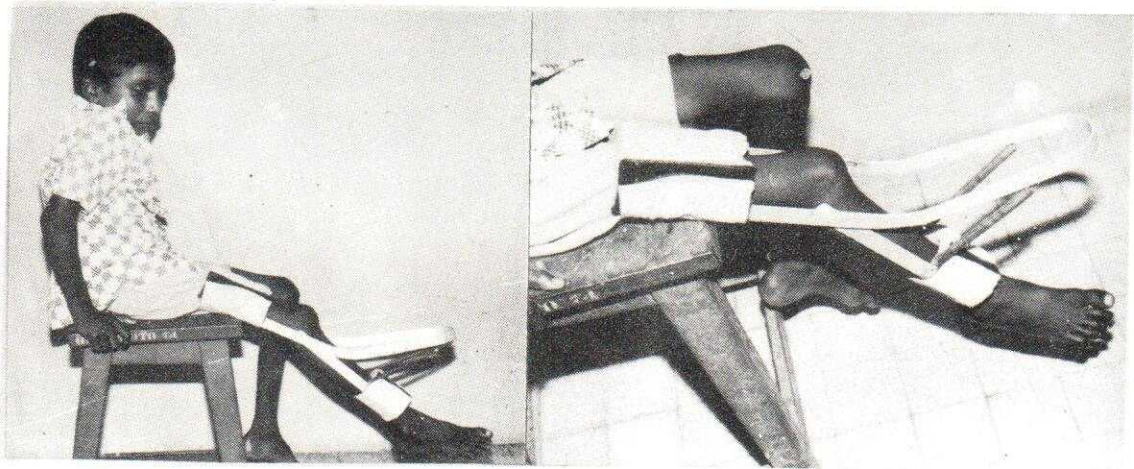


Fig. 3: Splint in use following knee Surgery.

Reference

1. Stewart, J.D.M. & Hallet, J.P. : Traction and Orthopaedic Appliances, Churchill Livingstone, 2nd Edition, 1983.