SPINAL ORTHOSIS FOR SCOLIOSIS
"A Preliminary Study"

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With the increasing consciousness of spinal deformities and their early detection, a large number of patients of scoliosis come for its management at an early age. If not treated early it leads to ugly rigid deformity of the spine. In such cases spinal orthosis play a very important role. Dr. Blount and Dr. Schmidt (1948) 1,2,3 gave the medical profession "Milwaukee Brace", spinal orthosis for treatment of early cases of scoliosis.

Though Milwaukee Brace even today remains an effective method of conservative treatment of scoliosis in mild mobile curve in skeletally immature patients but it has the disadvantage of being uncomfortable and unacceptable by the patient and needs time in fabrication, yet in cervico dorsal scoliosis it is the best type of spinal orthosis. In an effort to overcome the above mentioned disadvantage with Milwaukee Brace, a number of under arm plastic spinal orthosis have been developed. An ideal orthosis should be light, have good cosmetic & acceptable to the patient. It should permit good air circulation, simple and quick fabrication and should adequately correct the deformity. Patient should easily take off and put on the orthosis.

A number of under arm orthosis are now available like Lexan Jacket from Pasadena, PVC Orthosis, Orthoplast Jacket and Boston Brace. Bunnel, Mac Ewen, Hall, Park, Watts and Yates 4,5,7,8,9,10,11,12 have discreted different types of under arm orthosis. These orthosis provide a rigid support and is efficient in treating lumbar and thoraco lumbar curves and also helps in correcting thoracic curves with apex at about T7. It stops the progression of the scoliotic curves in growing children. It extends anteriorly from the sternum to the pubic symphysis, laterally from axilla to the trochanter and posteriorly from the upper thoracic region to the gluteal folds. This under arm orthosis (T.L.S.O.) has the disadvantage that it is not suitable for the cervico thoracic curves and prolonged use may alter the thoracic cage and even may restrict pulmonary functions in a child whose pulmonary functions are already low.

LOW TEMPERATURE THERMOPLASTIC SPINAL ORTHOSIS :

Recently we are using low temperature thermoplastic for Spinal Orthosis. This is a pink coloured perforated sheet in different thickness of 2 to 5 mm. This becomes transparent, soft and elastic at 60°C when kept in a tray containing hot water. Then it is easily moulded directly on the spine in maximum correction which hardens on cooling thus maintaining the corrected position. If any modifications are needed afterwards they may be done after reheating it. It has the property of elasticity and can be stretched to a great length as desired for moulding. It has the advantage of memory therefor it returns to its original shape when heated. This has the advantage that alteration can be made in a growing child. It has also self adhesive properties and velcro and tapes sticks to it when heated. The main advantage is that it is very quick and simple to fabricate as it is directly moulded over the spine and no negative or positive moulds are

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made. Another advantage is that it can be used for immobilizing the spine after surgery with internal instrumentation and bony fusion thus replacing Risser's plaster jacket.

OBSERVATIONS :

We have studied 30 cases of scoliosis in whom under arm orthosis was used. There were 16 female & 14 males in the age group of 2 to 16 years. There were 12 cases of congenital, 9 of idiopathic and 9 paralytic scoliosis. The degree of curve ranged from 18° to 95° with an average of 49°. Range of best correction was 37% to 68% while mean best correction was 52.9%. The treatment time was 2.5 years. Spinal major curve with apex between T7 and L2 gave best results. Patients should wear orthosis for about 23 hours a day. They may take out during swimming, dancing and other atheletic activities. After maturity patients may use the orthosis during sleep for some time. The weaning is gradual after skeletal maturity and carefully observed with frequent radiograph. Partial application of orthosis appeared as effective as full time wear. Orthosis has practically no significant effect on correction of rotation. A coordinated physical therapy programme is necessary to develop trunk muscles and for encouraging active correction.

WHAT BRACE TO BE USED ?

In single lumbar, thoracolumbar and thoracic curve with an apex below T7 under arm orthosis is advised. For cervico thoracic pulmonary functions are also not restricted.

WHOM TO BRACE ?

Curve under 20° must be kept under observation. In curves over 20° and especially over 30° orthosis should be prescribed. Curves over 50° in adolescense usually do not respond much to orthosis.

DOES ORTHOSIS CAUSE PERMANENT CORRECTION ?

No long term results of under arm orthosis are available since they have not been used for a long period. Some retention of the curve about 30° was noted when the brace was discontinued. It was thought that Milwaukee Brace gave permanent improvement but recent study from Milwaukee indicate most of the permanent correction is lost.

In future we have to find an orthosis for scoliosis which may give permanent improvement in scoliosis and cosmetically is accept- able to the patient. Low temperature thermoplast orthosis is light, has good appearance, helps in the correction of the curve and is directly moulded on the spine. This is a great step forward in orthosis for spinal scoliosis provided they live upto their promise.

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