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Spinal Affections in Rheumatological Diseases

Pradeep Kumar Dave

Head, Department of Orthopaedics
Rockland Hospital, Qutub Institutional Area, New Delhi.

ABSTRACT

A brief resume of management of rheumatoid arthritis in India is highlighted causes of deformity its radiological features and the goals of its management are discussed. Management included medical drug treatment, physical therapy and surgical treatment including synovectomy, osteotomies and joint replacement. Brief description of involvement of cervical spine in rheumatoid arthritis is also made.

The evolution of treatment of scoliosis starting from conservative to all stages of surgical treatment is also described. Surgical correction involved posterior instrumentation and fusion anterior release with or without instrumentation and fusion. Treatment of congenital and paralytic scoliosis is also discussed. Newer surgical modalities in treatment of paediatric scoliosis was also highlighted.

Keywords : Spine in rheumatoid arthritis medical treatment and surgical scoliosis correction, paralytic, congenital and in the paediatric age group.

Correspondence : Dr. P.K. Dave, A-8, Sector 26, Noida – 201301.

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INTRODUCTION

Rheumatoid arthritis (RA) affects about 0.75% to 1% of the general population. The onset of disease is particularly in the younger population within the age group of 35 to 50 years. RA is a highly inflammatory and destructive polyarthropathy affecting both small and large joints of the body. The disease results in a substantial personal, social and economic loss. About 80% of the patients affected with RA are permanently disabled after 20 years with a reduced life expectancy. Fortunately RA in Indian patients tends to be less severe as compared to western population; both geographic and genetic variations have been implicated as the possible causes.

Early radiographic changes consist of soft tissue swelling only. Advanced changes result in juxta articular osteopenia with narrowing of joint spaces due to articular cartilage destruction and juxta articular erosions as well. Later on large cystic erosions, bony proliferation and gross joint destruction constitute the picture.

Goals of therapy is to alleviate pain, control disease activity, slow joint destruction and improve quality of life. There should always be a team approach in management of RA patients. Team should consist of rheumatologist as the team leader, orthopaedic surgeon, physical and an occupational therapist. Psychologist and a social worker also form an important part of the team.

NSAIDs (Nonsteroidal Anti-

inflammatory Drugs) are the initial drug treatment of choice. They reduce pain and swelling thus improving function. NSAIDs do not alter the course of the disease or prevent joint destruction. Corticosteroids in dose as low as 10 mg (PREDNISOLONE) help to control acute flare ups. They act as a bridge therapy between initiations of DMARDs (Disease-modifying antirheumatic drugs) therapy and its onset of action. However its long term treatment is associated with side effects. DMARDs form the mainstay of treatment for RA. DMARDs can be used in various combinations and regimens. DMARDs therapy should be initiated at the time of diagnosis and should not be delayed for more than 3 months to avoid irreversible joint and bone damage.

Various DMARDs are in use these days such as hydroxychloroquine, methotrexate and sulfasalazine. Newer DMARDs include leflunomide, etanercept (TNF-receptor fusion protein), Infliximab (Chimeric monoclonal antibody which binds to TNF) and adalimumab.

Radioactive synovectomy can be done using radioactive isotopes (Yttrium-90, Gold-198, Erbium-169, Rhenium-186, Phosphorus-32, Dysporium-165). Laser arthroscopic synovectomy and total synovectomy is performed in refractory cases. In late stages of disease, surgical intervention becomes mandatory to improve function and to improve quality of life. Synovectomy in acute stage of rheumatoid arthritis occasionally results in remission in other joints also. Joint

replacement, arthrodesis, correction of deformities especially hand and feet, repair of ruptured tissues such as rotator cuff constitute the surgical aspect of treatment of RA.

The final treatment of joints which are deformed and have got stiffness respond well to joint replacement surgery. Most common replacement is in the knees but the hip joint, elbow and finger joints also respond well in replacement surgery.

Rheumatoid arthritis in spine usually affects young individuals. Cervical spine is involved more often than the thoracic and lumbar spine. Atlanto axial involvement is often the common involvement; pain and muscle spasm in the cervical spine involvement are common manifestations. Neurological symptoms are not common. However, in cases where myelopathy supervenes difficulties in gait and hand function may be seen. Radiological diagnosis if taken in conjunction with other clinical symptoms and laboratory investigations, other modalities like magnetic resonance imaging can be helpful particularly for evidence of compression of spine.

Treatment in most cases is proper immobilization of cervical spine to alleviate pain and avoiding any neurological damage. Cervical spine isometric exercises and cervical collar are helpful. Surgical intervention is resorted to if there is neurological damage or severe pain.

Advanced spondylotic changes call for surgical fusion of unstable spine.

There are a large number of techniques of fusion of spine for stabilizing the spine and thus alleviating the pain. RA sometimes also affects spine especially cervical spine.

Scoliosis :

Besides rheumatoid arthritis, I had also been interested in the treatment of scoliosis which occurs due to various aetiological factors. The basic principle of treatment of scoliosis is to control the curve till the growth of the child stops at puberty. After that period the scoliotic curve also does not increase.

However, some surgeons control the curve till the age of ten and then fuse the spine. In India, since the children are not very tall we prefer to fuse the spine at a much later age say around fourteen or fifteen years of age.

There are many ways of controlling the curve, ultimately a properly done spinal fusion is the gold standard of scoliosis treatment. The technique of a properly done spinal fusion is a meticulous one involving a thorough decortication of lamina upto the transverse process, excision of face joints and placing autologous bone graft on the decorticated area.

During the early seventies (1), Paul Harrington devised a rod which could be placed over the decorticated area. The curve was distracted with an outrigger engaging two hooks placed in the laminar space at two ends of the curve. Decortication was performed and then

autologous graft placed over decorticated area. This was followed by immobilization period of 6-9 months. However, the follow-up of a large number of cases, complications of Harrington rod began to appear, the commonest being breaking of the rod at the junction of the shaft of the rod and the ratchet.

The Harrington rod went into disrepute. Around the same time an era of segmental instrumentation came into vogue. The principle of segmental instrumentation was correcting the curve at each vertebral level of the curve. This was devised by a Mexican surgeon called Luque (2). The technique required excision of spinous processes passing a double loop wire through the ligamentum flavum and the lamina and then passing it around the vertical rod of the implant. However, it was a fiddly operation. Shuffle Barger HL *et al.* (3) also reviewed 234 cases of idiopathic scoliosis treated by segmental instrumentation meticulous technique. There were complications like neurological damage. In such cases removal of the implant posed a major problem.

Some surgeons combined both the procedures called the Harri-Luque instrumentation procedure. This technique required the Harrington rod to be placed on the concavity of the curve which was distracted. The double loop wire was then passed in a similar manner around the lamina and was tied around the rod to secure it in place. There was some limited success for this operation. Here also it was realised that although this procedure corrected the curve and rotation

of the curve to some extent the rate of complication like neurological damage was quite high.

However, in our country, scoliosis in the early stages of childhood was not treated adequately due to the mistaken motion that correction out once the child had reached the age of maturity. Hence the patients reported to us when the curved spine had become rigid and was not correctible by posterior instrumentation.

A very significant observation in relation to the curve and the rotation was made by Zeilke from Germany. He felt that approaching a scoliotic curve anteriorly would not only correct the curve but also the rotation. His anterior approach involved loosening of the curve by excision of discs in the curve. The vertebral bodies in the curve were fixed by means of screws placed in its body which were fixed by means of a rod. The whole assembly was then rotated by means of a strong lever. The space created by removal of discs was filled by bone graft taken from the excised rib. Most significant advantage of this technique was the correction of rotation.

In some cases after performing a Zielke instrumentation, posterior instrumentation and fusion was carried out either at the same sitting or after a week. In some cases where it was not possible to use Zielke instrumentation a simpler technique was used. After doing the anterior release and wound closure halo-traction was applied to the patient with the head end raised and the body weight acting as a counter traction. This

device was kept on for three weeks. The patient was then taken for posterior spinal instrumentation and fusion.

Congenital Scoliosis :

This was due to imperfect segmentation or restrictive segmentation unilaterally leading to a concave bar which necessitated an immediate fusion. In some cases there was diastematomyelia. The bony spur was excised posteriorly and then an anterior fusion was carried out. Dubousset J (4), Katti E and Seringe R, carried out epiphysiodesis of the spine in young children with congenital deformity (5). Freedman, Leong and Lub *et al.* performed a one stage combined procedure, both anterior and posterior excision of the hemivertebra in the lower lumbar spine. However, a periodic radiological analysis is done; if the curve is increasing excision of hemivertebra is to be carried out. If not, it should be left alone and to be kept under observation.

Paralytic Scoliosis :

These deformities have a long C-curve which should be maintained in correction with a Milwaukee brace and then fused posteriorly. In some cases a child with paralytic scoliosis had severe collapsing spine and both the lower extremities affected with polio. The case was operated with posterior instrumentation and in the postoperative care a corset was given and with a lateral linge the lower limb orthosis were incorporated. It is a very satisfactory

outcome since the patient who had never walked now had a posterior gait albeit with a support.

Newer techniques for correction are being devised particularly in growing children where the device has to be distracted periodically as the child grows.

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