MEDICAL EDUCATION

Sport Injuries of the Lumbar Region

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A THOROUGH knowledge of the anatomy of the spine particularly of the lumbo sacral area is essential in the diagnosis and treatment of injuries of the lower back.

The lumbar vertebrae articulate with each other through facetal joints formed by superior and inferior articular process of adjacent vertebrae and by fibrocartilagenus disc, interposed between the vertebral bodies. That disc consist of an inner soft nucleus pulposus surrounded by an outer firm annulus fibrosis and act as shock absorber (Hugo A.[1]).

The anterior and posterior longitudinal ligament connect the front and back of the vertebral bodies, ligamentum flavum, interspinous and supraspinus ligaments connect the laminae and spinous processes.

The lumbar spines is more vulnarable to strain than any other part of the back because of the range of movements and the stress it is subjected to, specially in sports such as gymnastics, weight lifting, contact sports and marathon running.

For practical purposes injuries to the lower spines can be discussed under three headings:

1. Soft tissue injuries
2. Bony injuries
3. Disc injuries

1. SOFT TISSUE INJURIES

This can result from direct trauma to the back as in contact sports or indirectly when there is rotational strain to the ligaments of the back and in bending and lifting such as in fast cricket bowling, marathon running and weight lifting (Michael J. Goldberg [2]). This back strain may result from muscle or ligament injury and usually present as immediate discomfort to the back often not severe to start with but more in the form of stiff back due to muscle spasm. Frequently this pain worsens with activity.

Examination reveals paraspinal spasm, diminished back movements but no positive SLR and no positive neurological signs in the lower limbs.

X-Ray which should be done usually reveals straightening of the normal lumbar curvature secondary to muscle spasm.

The management of this condition like all back problems should start with rest on a firm bed with pain killers and muscle relaxants.

Physiotherapy in the form of heat and later exercise are often helpful and the majority of back subsides quickly at this stage.

If muscles spasm persist inspite of the above treatment and discogenic prolapse is excluded clinically then local anaesthestic infilteration in the paraspinal muscles may help.

Return to sport should be advised when there is no pain, no paraspinal spasm and back movements are pain free and full.

2. BONY INJURIES

Fractures of the body of lumbar vertebrae is uncommon in sports, more common is fracture of the transverse process which may result from direct blow, from twisting force to the back and from forceful muscular contracture causing avulsions of the transverse process.

If there is no urological complications such as ureteric injury then the incapicitating factor is not only the fracture but also the associated muscular tear.

Both stable fractures of the vertebral body and avulsion fracture of the transverse process should be treated by bed rest until the pain

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subsides to be followed by back extension and isometric abdominal exercises to allow for full mobility and strength.

SPONDYLOLYSIS

Spondylolysis means a defect of the pars-interarticularis and usually occurs at 4th or 5th lumbar vertebrae (Hutton W.C.[3]). This has been proven to be stress fracture in most of the cases and that the forward thrust makes the lower lumbar region the most susceptable site (Jackson D.W.[5]) in 1976 reported in radiological studies of 100 female competitive tymnastics spondylolysis incidence of 11% compared to only 2 — 3% in similar female population. Spondylolysis is also common in weight lifter and weight trainers.

Spondylolysis is at times asymptomatic and does not interfere with competitive training but if there is repeated stress to the back symptoms usually appear. The main complaint is low back pain often to one side and often localised to the paravertebral muscles which make the examiners confuse it with muscle strain. Clinically there is diminished back movements specially extension and possibly diminished SLR. Specially in gymnastics if SLR is less than 90 then the condition should be borne in mind. X-rays are usually diagnostic and lesion is best seen on oblique films which may demonstrate unilateral or bilateral pars defect or atenuated pars inter-articularis.

Several authors (Hutton W.C.[3], Cryon B.M.[4]) reported that if the stress fracture is fresh one and the back is given proper immobilization healing may occur in some spondylolytic lesions. However asymptomatic relief can be achieved by bracing and physiotherapy to go back to sport this should be followed by rehalititative exercise program which should include exercises to strength the back and abdominal muscles.

No return to sport is advised till adequate trunk control and strength are achieved. Surgery attempting to close the gap with screw "Bucks" has been tried but unjustified if it is done only to return the athletes to competitive training and studies has shown that spondylolytic athletes returning to sport after surgery show lower performance.

SPONDYLOLI-THESIS

This means spontaneous displacement of lumbar vertebral body upon the segment next below it. This could be secondary to spondylolysis or to congenital malformation of the articular process. Spondylolythesis usually indicates unstable spines which is easily subjected to strain leading to recurrent disability and constitute great problems in sports (Hugo A.[1]). Though it could be asymptomatic, symptoms are very common, being back pain worse by exercise that radiate down the buttocks and may be in siatic distribution.

Bed rest followed by bracing usually help and return to sport is not contraindicated but because of instability participation in sports are limited. Treatment by surgical fusion for sport purposes is not justified and evaluation should include ability to compete again following fusion of fourth lumbar vertebrae to the sacrum.

3. DISC INJURIES

Compression strain with the back flexed is the usual mechanism of disc prolapse, specially in weight lifter and gymnastics when there is no back conditioning and warm up prior to participations in sports. In discogenic prolapse the commonest is postero lateral prolapse at L4-5 or L5-S1 region. As the disc herniate it presses on the post longitudinal ligament causing low back pain but no radiation at this stage, further prolapse due to repetitive flexion force exerts direct pressure on the nerve root causing mechanical irritation with subsequent pain in the lower limb. Should the motor fibres also be affected atrophy and weakness of the muscles innervated by the affected nerve occur.

Clinically the patient present with sudden onset of pain in the lower back immediately or within few hours after the injury. The pain may radiate down the buttocks, hamstring and outer calf area may be associated with parasthesia. The pain may be relieved by bed rest but subsequent attacks usually come following trivial events such as coughing or sudden forward bend.

Examination may reveal scoliosis secondary to muscle spasm with diminished back movements specially flexion and tenderness at mid line of lower back and buttocks. That of the lower limbs may reveal dimished SLR, there may be altered sensation. There may be muscle weakness and ankle jerk may be depressed or absent secondary to nerve root affection.

X-Ray may reveal no abnormality but may show straightening of normal lumbar curvature and scoliosis. Diminished disc space are characteristic of long standing prolapsed disc.

Treatment is bed rest or back rest in a corset or plaster jacket or if the pain is less modification of activity will help. Physiotherapy includes heat and exercises using the same reconditioning program mentioned before.

Surgery to remove the disc is indicated if conservative program fails or if there are neurological signs in the lower Limbs. Lumbar mylography or discography should be done to confirm the diagnosis and exclude other conditions such as neoplasms. Active conditioning program must start once the patient is pain free, and return of sport should be allowed once trunk control and strength are achieved.

A group of athletes with low back pain were reviewed by Jackson[5] when he found a that 40% had symptoms related to spondylolysis while only 10% had symptoms related to discogenic prolapse.

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