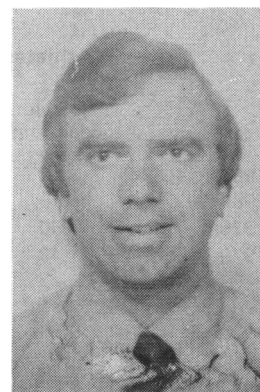




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BACK PAIN IN ATHLETES

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ABSTRACT

There were one hundred and ninety seven patients who presented with back pain to an Athletes Clinic over four years. Their mode of presentation, investigations, diagnoses and treatments are analysed. The majority of patients were male and below 30 years of age. The average duration of symptoms prior to presentation, despite an easy access policy, was 42 weeks. Injury was usually related to six popular sports. Radiological examination was a rewarding investigation in these patients and included an A-P view of the pelvis. The diagnostic label of prolapsed intervertebral disc appears to have been used too frequently. Physiotherapy was the most useful treatment modality regardless of age, mode of onset and duration of symptoms.

INTRODUCTION

Back pain continues to be a common source of morbidity and anxiety in the United Kingdom (Benn and Wood, 1975). Just over 20% of all orthopaedic referrals are due to backache (Waddell et al, 1979) and a number of these may well relate to some form of sporting activity. This relationship may take the form of an acute or chronic injury; may be related to improper protection by virtue of defective training or equipment; or may reflect the tendency for certain sporting pursuits to damage specific areas of the body (Kotani et al, 1971). This study arose from the observation that the percentage of patients presenting to an athletes clinic with a predominant complaint of back pain, with or without concomitant sciatica, was slowly increasing.

MATERIALS AND METHODS

The Middlesex Hospital Orthopaedic Department has for over 30 years provided a diagnostic and treatment facility to athletes either by referral from general practitioners or on production of evidence of membership of a club. It is an appointment system which usually takes

up to two weeks to be seen and so there is some pre-selection of patients. The analysis covered retrospectively the years 1978-1981 inclusive and has used the clinical details of eight different clinicians who each ran the clinics for a six month period. Because of this the diagnoses made and treatment modalities used probably follow a broader spectrum than had a solitary clinician been involved throughout the period.

CLINICAL DATA

The number of patients attending the Athletes Clinic for each year between 1978 and 1981 can be seen in Table I. The proportion of patients presenting with back pain shows a small increase of two per cent within the period studied. A total of 197 patients were seen with this complaint and these form the basis of this review, 34 (17%) were female and 163 (83%) male. The age range was between 13 and 53 years and the distribution can be seen in Table II, and sixty five per cent of cases were below the age of thirty.

The majority of patients were referred directly to the clinic by a letter of introduction from their club. In 63 cases however referral was from their own general practitioner either in the form of a referral for diagnosis or as a request for treatment. The sporting activity can be seen in Table III. Over 70% of cases came from participants of these six popular sports. This, of course, does not suggest that these pursuits are more likely than others to cause back pain and may merely be a reflex

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TABLE I
Athletes with back pain.

Year	No. with back pain	Total seen	%
1981	56	727	8%
1980	48	669	7%
1979	50	758	7%
1978	43	718	6%
	197	2872	6.8%

TABLE II
Age Range (13 to 53 years)

Less than 20	41	21%
20-29	87	44%
30-39	54	27%
40-49	13	7%
More than 50	2	1%

TABLE III
Sporting Activity

Soccer	36
Rugby	32
Track	30
Squash	17
Hockey	15
Cricket	14
	144 (72%)
Others	53
	197

tion of the popularity of the particular sport within the community. The remaining 28% of cases came from 17 other activities which are not listed. Weight lifting and rowing which are notoriously bad for backs produced four cases, whereas interestingly swimming and cycling, both often recommended activities for the back problem produced the same small number!

The mode of onset could be related to an acute incident in 85 cases (43%), but the majority of cases gave a history of a chronic or non-specific mode of onset. The pattern of duration of symptoms prior to presentation is summarised in Table IV. The commonest mode was a duration of symptoms of between six and twelve weeks. The mean duration of symptoms was 41 weeks but if the group is separated into acute and chronic modes of onset the means are 13 weeks and 58 weeks respectively.

Clinical examination of the group appears on the whole to have been unrewarding. The majority showed

TABLE IV
Duration of symptoms.

Not stated	11	Average	41 weeks
Less than 2 weeks	26	'Acute' av.	13 weeks
2-5 weeks	34	'Chronic' av.	58 weeks
6 weeks-3 months	50		
3-6 months	25		
More than 6 months	51		
	197		

some diminution in lumbar flexion as measured directly between the T12 spinous process and the sacrum. Rotation and lateral flexion were usually full and painful extension was only recorded in 22 cases.

Neurological abnormalities were only detected in 29 cases; six cases showed nerve root compression signs (sensory alteration, motor weakness or reflex suppression) whereas 23 patients showed positive root tension signs (Laseguè's, Kernig's or Bowstring tests). The diagnosis made in response to these signs can be seen in Table V.

TABLE V
Root signs.

	No.	Initial Diagnosis
a) Compression signs	5	P.I.D.
	1	Spondylolisthesis
b) Tension signs	18	P.I.D.
	2	Mechanical
	2	No diagnosis
	1	Facet joint pain
	29	

Radiological examination was performed in 163 cases (83%). It included an antero-posterior view of the pelvis in all cases. Radiological investigation provided no further information in 101 cases. Abnormalities were shown in 52 cases (Table VI). In 29 cases (15%) the radiological abnormality demonstrated was accepted as the eventual diagnosis, notably in spondylolysis, spondylolisthesis, fractures and a proportion of those cases exhibiting degenerative changes of the facet joints. The extension of the routine radiology to include the pelvis led to two cases of hip pathology being revealed as the causation of the symptoms.

The initial clinical diagnosis made by the clinicians following radiology is summarised in Table VII for 187 cases. The majority were thought to exhibit features of either a mechanical back pain or a prolapse of the intra-vertebral disc. In 24 cases no initial diagnosis could be made. Table VIII summarises the diagnoses in the remaining 9 cases.

TABLE VI

Radiology

Not performed	34
Normal	101
Spondylolysis	6
Spondylosisthesis	6
Fractures	7
Anomalies	14
Degenerative	26
Others	3
	197

TABLE VII

Diagnosis at initial visit

Mechanical Pain	75
P.I.D.	51
No diagnosis	24
S.I. joint	12
Degenerative	7
Fractures	7
Spondylolysis/lsthesis	12
Miscellaneous diagnoses	9
	197

TABLE VIII

Miscellaneous diagnoses

Trochanteric bursitis	2
Instability	2
Lipoma	1
Scheuermann's disease	1
Old T.B. hip	1
Slipped femoral epiphysis	1
Hamstring strain	1
	9

Treatment modalities used are summarised in Table IX. There were 147 (75%) patients who received supervised physiotherapy; 18 cases were instructed to rest and we have no proof that this advice was heeded or not. Only six patients eventually came to orthopaedic surgery requiring the administration of a general anaesthetic. These procedures were three lumbar spinal fusions, two cases of intervertebral disc excision and one caudal epidural injection and spinal manipulation. No patient had any local injection into a trigger area.

All the patients were followed up until they were able to return to their sport. The number of follow-up consultations at monthly intervals can be seen in Table X, but thirty two patients did not attend at some point in the follow-up.

TABLE IX

Treatment

Physiotherapy	147
Educational advice	33
Rest	18
Surgery	6
Non-steroidal anti-inflammatory drugs	4
Analgesics	2

TABLE X

Number of follow-up consultations

Weeks	Patients
4	73
8	56
12	24
16	10
20	2

DISCUSSION

Analysis of the clinical data reinforces a number of commonly held beliefs. Firstly that the most likely patient presenting with back pain related to a sporting activity will be male and under thirty years of age. The complaint is also likely to arise from participation on one of six popular sports. There were, however, a number of totally unexpected findings arising from this study. The delay between onset of symptoms and first consultation was a surprising feature. We do not think that this was the product of the appointment system but reflected the failure of symptoms to resolve as the motive of referral. It is well known that irrespective of treatment the patient has a 90% chance of recovery within six weeks (White, 1966). Less than one third of our cases presented within this period and, therefore, represent a preselected group. There was no statistical difference in the time taken to resolution between those of acute and those of chronic onset. There was also no difference between those presenting before six weeks and those with a longer history. Early access to physiotherapy in back pain cannot be supported from this study.

The use of radiology as a primary means of investigation has been criticised by Nachemson (1976) in that it only has a 1 in 2500 chance of demonstrating features of practical significance. In this series, excluding those films showing degenerative features, 19 cases revealed significant abnormalities in the lumbar spine and 2 had significant pathology revealed by including a film of the pelvis. It is well recognised that cases under 20 years have an 11% chance of spinal pathology when presenting with back pain, twenty-one per cent of our cases were in this age group and we concur with Vecchio (1966) that plain radiographs are a sensitive test of spinal pathology in our patients.

In the majority of our patients the diagnosis was mechanical back pain. This has been defined by Fiddler (1980) as pain which is episodic and cyclic, often radiating to the buttock and upper thigh, often with morning stiffness and pain. Start pain is common, as is a catch point. The pain becomes worse during the course of the day and is made worse by exercise. The aetiology of this symptom complex is still very much in dispute. The work of Nachemson (1975) shows that the most sensitive areas reproducing pain when stimulated, were the posterior part of the annulus fibrosis, the posterior longitudinal ligament and the nerve root itself, the latter producing typical pain in a root distribution. These findings imply that mechanical pain may well be of discogenic origin without a recognised prolapse. The facet joints have also been implicated (Mooney and Robertson, 1976) as has primary instability. Unfortunately, most radiological signs of this syndrome show an equal occurrence in both symptomatic and asymptomatic groups (La Rocca and Macnab, 1969). Travell (1976) proposed the existence of sensitive trigger points in muscles stimulation of which could produce referred pain. Local anaesthetic infiltration of these points can abolish pain permanently. This work has been dismissed as a placebo response but Meadows (1970) by use of EMG localised painful areas in muscle which were sensitive to various stimuli.

The second most frequent diagnosis was that of a prolapse of the intervertebral disc. This deserves closer scrutiny. The work of McCulloch (1977) has shown clearly that for the diagnosis of a prolapsed lumbar disc three out of four diagnostic criteria should be found. These criteria were three clinical: Predominant complaint of leg pain in a root distribution, positive root irritation signs and positive root compression signs, together with one radiological sign that of positive contrast radiology. There is a tendency for any leg pain associated with back pain to be labelled as sciatica and to be likewise labelled as due to a prolapsed disc. This probably accounts for the large number of our cases (51) who were given this diagnosis. Care is required in the evaluation of root tension signs. Straight leg raising reproducing back pain is of no significance but is so if root pain is reproduced (Edgar and Park, 1974). Cross leg pain is of even greater significance (Hudgins, 1970). In this series only 29 cases showed root tension or compression signs, six of these were submitted to contrast radiography in the form of a water soluble myelogram or discography (Fig. 1). Only two underwent subsequent excision of a prolapsed intervertebral disc.

The significance of the finding of spondylolysis or spondylolisthesis on radiographs requires careful elucidation by the clinician. The incidence of these lesions in the UK population is thought to be around 5%, although in a series of patients below which the age of 20 presenting with back pain the incidence is 12%

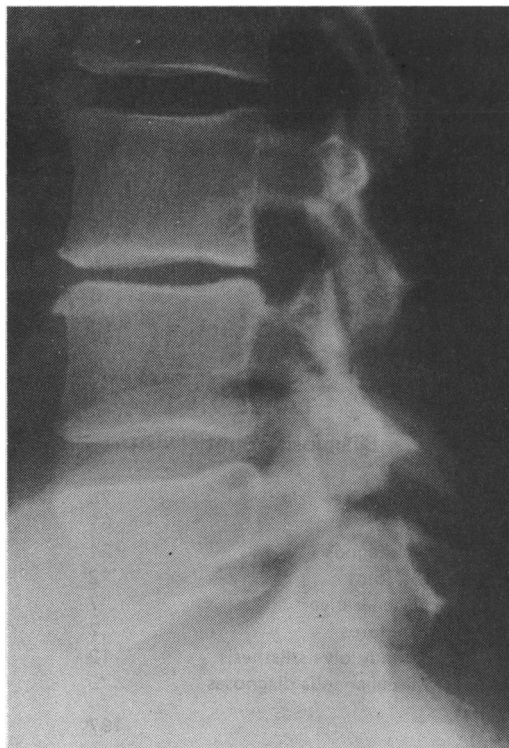


Fig. 1: Lateral radiograph. Type IIb Spondylolisthesis.

(Waddell, 1982). In this series there was good circumstantial evidence that two of the six cases of spondylolysis were due to an acute fracture of the pars interarticularis. Neither healed spontaneously. Of the six cases of spondylolisthesis one was of a dysplastic or Type I variety whilst the remainder were of the lytic isthmus or Type IIa according to the classification of Wiltse et al (1976) (Fig. 2). Two cases of spondylolysis eventually underwent Buck's fusion (Fig. 3) (Buck, 1970), and one case of spondylolisthesis underwent a Wiltse type of posterior fusion (Wiltse, 1973). The remaining cases were treated with physiotherapy alone.

The analysis of the treatment modalities chosen is extremely difficult. Rest with or without analgesic preparations is usually not acceptable to athletes and was rarely used in this series. It is certainly most suitable to acute pain and such regimes have been shown when combined with an educative back school programme to lead to earlier return to work and fewer recurrences during the following year (Bergquist-Ullman and Larsson, 1977). Non-steroidal anti-inflammatory agents were similarly rarely prescribed although their efficacy in soft tissue sports injuries has been well shown (Simons et al, 1982). In over 75% of our cases treatment was by referral to physiotherapy. Such treatment is of course

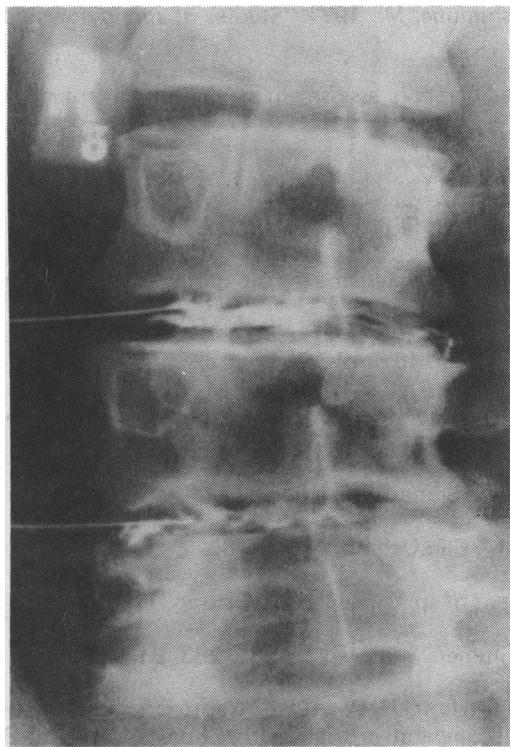


Fig. 2: A.P. view of abnormal discograms.

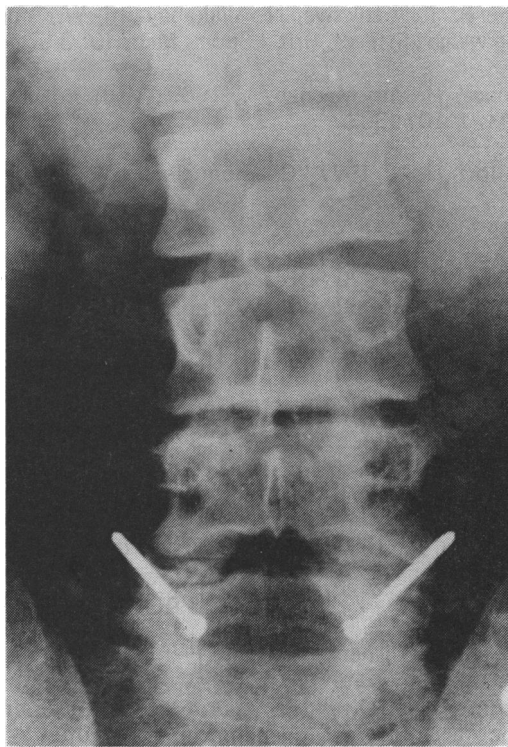


Fig. 3: A.P. view of Buck's fusion.

impossible to quantify, but following assessment it generally fell into two spheres as outlined by Santiesteban (1983). Initially physical agents such as shortwave and ultrasound and the more effective transcutaneous nerve stimulation were used to control pain. When pain was controlled by whatever means, then physiotherapeutic manipulations and graded exercises were commenced (Maitland, 1973). Nachemson (1983) has recently

reinforced his opinion that a treatment programme geared towards activity rather than passivity is the essence of rehabilitation. Such a programme will avoid the deleterious effects of inactivity on cartilage and muscle, and there is evidence that activity in large muscle groups will increase endorphine levels which in turn will lessen sensitivity to pain (Scott and Gijsbers, 1981).

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