LOW BACK PAIN DUE TO ARTERIAL OBSTRUCTION*

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There are enough commonly known causes of backache to torment, as well as to test the skill of the practising physician. In addition to the more recognised causes, backache from vascular obstruction must be considered. The following observations support this fact.

The term claudication properly means limp, and in some instances there may be no pain but only weakness of the legs with disturbance of gait. "Intermittent claudication" has generally been applied to the cramp-like pain in the calf brought on by exertion and relieved by rest. This symptom, as a rule, is so typical in the lower extremities that when such information is obtained the diagnosis of arterial obstruction may readily be made. Even in the absence of the more frequent discomfort in the legs, such pain may be located in the muscles of the low back and gluteal regions. Because the pain in the low back may be the predominant, or at times the only, symptom of arterial obstruction, the actual etiology may be overlooked and the back pain attributed to some local disease of the musculo-skeletal system.

Such observations have been made before in isolated cases. Homans (1939) stated that the discomfort of peripheral vascular disease could at times simulate "sciatic neuritis." Lerich (1940) described the syndrome that now bears his name, and in a more complete account (Leriche and Morel 1948) he emphasised that thrombotic obliteration of the aortic bifurcation does not necessarily cause a typical cramp-like calf pain, but that more frequently the patient complains of easy fatiguability in the lower extremities. Although none of the four patients that he reported had associated low backache, one had symptoms typical of "sciatica." Leriche mentioned other signs and symptoms, such as impotencia erigendi, pallor of the legs and feet when standing, and global atrophy of both lower extremities, and these symptoms have often been regarded as an essential feature of aortic or iliac obstruction. Subsequent workers (Morel 1943; Kramer, Perilstein and de Medeiros 1958) have found that any or all of these additional signs may be lacking and that the only symptom may be that of pain or weakness in the legs.

Other observers (Ortner and Griswold 1950; Samuels 1950; Goodwin and Petrie 1951; Kekwick, McDonald and Semple 1952; LeFevre, Phalen and deWolfe 1953; deWolfe, LeFevre, Humphries, Shaw and Phalen 1954; and Phalen 1955) have reported cases of cramp-like suffering in the low back associated with similar pain in the gluteal muscles and in the muscles of the thighs and calves after exertion. Pain localised exclusively in the back, however, has not received adequate attention.

The present study was prompted by the investigation of several patients with aorto-iliac obstruction who appeared with low back pain as the initial symptom. Sixty patients, fifty-two men and eight women, were seen at the Johns Hopkins Hospital in a period of six and a quarter years, between June 1952 and September 1958. The diagnosis of aorto-iliac obstruction was proven in each case either by aortograph, operation, or both. Analysis of these cases showed that thirteen of the sixty patients had low back pain, with or without "sciatica" as a prominent symptom. In two instances the low back pain was attributed to a previous injury to the back, and in one other instance to a urinary tract infection. Ten patients had been

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treated for neuromuscular disease of the back; in one of these a ruptured intervertebral disc
had been removed with relief of symptoms eight years before the vascular symptoms developed.
In the others, the orthopaedic treatment was not so clearly indicated, if at all.

There were two negative explorations for ruptured intervertebral discs, and two spinal
fusions. In one of the latter cases an exploration of the hip was carried out, all without relief
of the back pain or the "sciatica."

Of the thirteen patients with low back pain, four had lumbar sympathectomy performed
with some relief of back pain, and another died after an extensive endarterectomy of the
entire abdominal aorta. This left eight patients available for follow-up study who had had
their circulation re-established by endarterectomy or some type of arterial graft. Six of these
eight patients, or 75 per cent, had relief of their low back symptoms after re-establishment of
the circulation. In two patients no relief of back pain was obtained from the operation. One of
these patients had clinical and radiological evidence of degenerative discogenic disease, for
which he had had previous non-operative treatment. The following case histories illustrate
these points.

CASE REPORTS

Case 1—A woman of forty-seven complained of low back and sacral pain of eleven years' duration, which followed walking with crutches after a fracture of the left femur. Her gait
returned to normal, but the back pain persisted. It was believed that her back pain was
psychogenic, and she had had prolonged psychiatric treatment, including a series of shock
treatments. Although her functional condition improved, the back pain became progressively
worse and incapacitating. She consulted several orthopaedic surgeons during this period,
and was given many of the usual forms of routine treatment, such as back supports, physiotherapy, and a bed board. She had been admitted to another hospital two years before
consulting us, at which time a myelograph had been performed with negative results. She
then received another long course of physiotherapy, including postural exercises. Eighteen
months before we first saw her, she noticed that the low back pain became worse after walking
a short distance. Soon thereafter, for the first time, she began to notice numbness and coldness
of the feet and legs. The back pain was not aggravated by activities requiring bending,
stooping, lifting, or twisting, and the pain in the back and legs was not increased by coughing,
sneezing or defaecation. The general orthopaedic examination showed no abnormality except
for the residual effects of the fracture of the left femur. Neurological examination was normal.
Examination of the back was also within normal limits, including straight leg raising and
rectus femoris tests. Both feet were cold and we were unable to palpate the femoral, popliteal,
the dorsalis pedis, or the posterior tibial pulses on either side. Radiographs of the lumbar
spine and sacrum showed mild hypertrophic arthritis, but considerable calcification of the
abdominal aorta was observed. Aortography showed occlusion of the distal aorta and
common iliac arteries. An aorto-iliac endarterectomy was performed with the establishment
of moderate pulsations in the vessels of the legs, and she has subsequently been free from
symptoms in the back and extremities.

Case 2—A woman of forty-five had sought advice fifteen years before on account of low
back pain which had come on after childbirth at the age of twenty. At that time examination
had shown a "sway" back with scoliosis. Postural low back strain was diagnosed and she
was given a back support, a series of postural exercises, and a lift on one of her heels to level
the pelvis. She obtained considerable relief from these measures. She had then been well
for nearly fifteen years, when low back pain again developed and progressively increased.
When we questioned her it was revealed that in addition to the back pain she also had sacral,
gluteal and groin pain, aggravated by walking short distances. Other than the old postural
defect, nothing significant was found on examination of the back. The right femoral pulse
was not palpable, and no pulse could be felt in either foot. An aortograph revealed obstruction
of the terminal part of the aorta and both common iliac arteries. Endarterectomy was performed. Recent follow-up indicated that the back pain has disappeared.

Case 3—A man of forty-six had first noticed pain in the right hip while engaging in athletics fifteen years before. The pain became increasingly severe in the following three years. Later, he noticed that playing nine holes of golf aggravated the hip pain, so that he was forced to give up the game. Two years before we saw him he found himself unable to walk more than a short distance because of incapacitating low back pain. At another hospital a spinal fusion had been performed without relief of his symptoms; later, the right hip was surgically explored but nothing abnormal was discovered. Later, when the true nature of the trouble was suspected he was admitted to the Johns Hopkins Hospital, where an aortogram showed aorto-iliac obstruction. At operation the diseased artery was resected and a homograft inserted. Follow-up showed no further low back pain, but he still had mild pain in the right buttock after walking.

**DISCUSSION**

The diagnosis of low back pain from arterial insufficiency is easily made when other symptoms are present, such as the typical cramp-like pain in the calf on exercise, fatigue on walking, numbness and tingling of the legs, coldness of the extremities, or impotence. However, since such symptoms are frequently not seen early in the course of the disease, it is important to consider carefully the patient’s description of the pain. With intrinsic disease of the back itself, stress on the back such as in bending, lifting, stooping and twisting may cause the pain to appear or aggravate it while these movements are being performed. This is usually as severe on the first such movement as on subsequent ones. On the other hand, in back pain from arterial obstruction the activity must be repeated before the pain appears. Repeated activity causes a muscle to outstrip its blood supply, thereby inducing pain or weakness because of its inadequate circulation. Therefore, an important clue may be obtained by merely asking the patient what brings on the pain and what he does about it. Characteristically, he states that it disappears after several minutes of rest, but, when activity is resumed this effort brings on a similar episode. The site of the obstruction can sometimes be deduced from the character of the pain. Pain in the low back itself is often associated with obstruction of the terminal part of the aorta. Occlusion of the common iliac artery is characteristically associated with pain in the buttock, but this buttock pain may also appear with obstruction of the internal iliac [hypogastric] artery alone. Such pain in the back or buttock may or may not be associated with pain in the thigh or calf.

Presumptive diagnosis of thrombosis of the lower part of the aorta or of the iliac vessels, alone or together, is aided by the finding of calcification in these vessels on the plain radiographs of the abdomen or spine. An aortogram may be indicated to confirm the obstruction and to demonstrate its precise site. The diminution or absence of the femoral and distal pedal pulses is the most consistent confirmatory finding, however, and this is the simplest and clearest aid in the diagnosis of aorto-iliac obstruction.

**SUMMARY AND CONCLUSIONS**

A considerable proportion of patients with thrombosis of the aorta or its bifurcations exhibit low back pain either alone or in conjunction with other symptoms of this disease. Arterial obstruction should be considered in every patient presenting himself with low back pain. The importance of the history in making this diagnosis cannot be overemphasised. Back or leg pain, or both, coming on after exertion should suggest the diagnosis even in the absence of the other well recognised symptoms of arterial insufficiency. Therefore, to affirm or deny this suspicion, it is essential that palpation of the femoral and peripheral pulses be made a routine and integral part of every orthopaedic examination in patients complaining of low back pain. When pulses are not palpable or are diminished, and in the absence of other
clear musculo-skeletal disease, consideration should be given to further and more specific diagnostic procedures, such as aortography. Only in this way can an occasional baffling and elusive case of troublesome backache be fully understood and the appropriate treatment instituted.

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REFERENCES


