There has been a good deal of discussion concerning the aetiological factors in chronic cervical myelopathy secondary to spondylosis, and it seems likely that several exist and are of varying importance in different cases. One of them, first suggested by Taylor (1953) and more recently by Schneider *et al.* (1954), Daniels (1956), and Bradshaw (1957), concerns the role of the ligamentum flavum which forms the posterior wall of the cervical spinal canal. In some elderly persons there is a permanent corrugation of this ligament related to the degree of disk degeneration, and when the neck is extended protrusion into the spinal canal is enhanced so that distortion of the posterior surface of the spinal cord occurs. Although visible at necropsy, it may have produced no symptoms during life. The anterior lesion produced by the extension of disk, osteophyte, and posterior longitudinal ligament into the spinal canal is likewise increased by neck extension and may also be symptomless. Thus either lesion may be silent when alone or at different levels, but if they are considerable and opposite each other the cord will be caught between two potent cord-compressing structures whenever the neck is extended, and a very severe degree of cord destruction may result (Clarke and Little, 1955). An exact correlation between the course of the disease and the known pathological findings is, however, notoriously difficult. The former is no doubt dependent upon the relative size of the anterior and posterior lesions as well as upon the other aetiological factors which have been postulated to account for the complex clinical picture characteristic of cervical myelopathy.

The myelograms in both Cases 1 and 2 demonstrated the two lesions very well, for in each there was a break in the column of radio-opaque material when the neck was in extension, but which was less apparent with the neck in a flexed or neutral position. Anteriorly a filling defect was readily seen, but posteriorly there was an equally significant one, shown best by Fig. 1 on the Special Plate.

The prognostic and therapeutic aspects of the cases described here are also of interest and importance. The benign course of the disease is demonstrated, but it is possible that, if serious cord compression is intermittent and occurs only with extension movements of the neck, a severe clinical picture would not be expected initially. Spondylosis, dependent as it is upon degeneration of the ageing intervertebral disk, is probably always progressive, and aggravation of the present state is therefore likely, although this advance may be very slow and at times imperceptible.

Despite the absence of active treatment, such as neck immobilization or surgery, the patients have each reported improvement, although objectively there has been little change. While the subjective improvement could be explained by the patients' becoming more attuned to their symptoms, there has nevertheless been no recent increase in signs. The first patient has stopped heavy work, and this is a well-recognized method of producing a temporary arrest or improvement. The importance of careful observation in this condition before advising surgical treatment is obvious. Should their condition deteriorate the patients will be advised to wear a collar, and if this is not effective a simple laminectomy with division of the dentate ligaments will be considered. In view of the nature of the lesion demonstrated, such an operation would be expected to give some relief.

Summary

Two cases of chronic cervical myelopathy due to spondylosis are described. Each had a clinical picture which was initially ascribed to peripheral neuropathy, but it was eventually possible to demonstrate compression of the cervical spinal cord in both of them. The responsible lesion had two components, the more usual one involving the anterior surface of the cord, and a posterior one due presumably to corrugation of the ligamentum flavum and explaining, perhaps, the predominance of sensory features in these cases. Conserva-

tive treatment has led to symptomatic improvement, and the benign and lengthy course of this condition in some patients is emphasized.

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AN UNUSUAL SITE FOR GRAVITATIONAL ULCERS

SOME OBSERVATIONS ON A CASE OF DEEP-VEIN THROMBOSIS

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[WITH SPECIAL PLATE]

Gravitational ulcers, a sequel of deep-vein thrombosis, are usually situated around or above the malleoli where perforating venous channels can be found (Cockett, 1955). Ulceration between the toes is uncommon, though it is described after sympathectomy for persistent gravitational ulceration (Linton, 1953).

Following thrombosis of the popliteal or superficial femoral veins, blood may return from the foot either through recanalized, and therefore valveless, deep veins or through the superficial veins. These superficial veins may already be varicose with incompetent valves, or may become incompetent as they dilate. There seems to be no evidence of a compensatory deep venous collateral circulation developing in any way comparable to the collateral circulation developed after an arterial blockage.

The common sequel of venous engorgement leading to ulceration is usually prevented by a strong elastic support, particularly the "blue line" elastic bandage. The case described here demonstrates how a "blue line" bandage promoted healing of the malleolar ulceration, but caused severe congestion of the toes with eventual ulceration. Evaluation of the clinical findings and a venogram led to the discovery of a satisfactory method of elastic support.

Case Report

A machine attendant aged 35 complained of repeated painful ulceration between the toes of his left foot, for the past twelve months. He had lost three months from work because of this. At the age of 15 he suffered a slipped epiphysis in his left hip, and when he was 22 he began to have pain in the same hip; this gradually got worse until January, 1953, when, at the age of 32, he underwent a subtrochanteric osteotomy. After the operation he was immobilized in a plaster spica for six months. One week after the plaster was removed he developed a deep-vein thrombosis in the left leg. This was treated by rest and support, but later when he was walking around on crutches the leg became swollen, and by December, 1953, five months after the thrombosis, he had areas of ulceration on the outer side of the ankle. This was treated with "blue line" elastic bandaging, and the malleolar ulcers healed and remained so. The bandages were comfortable, but he did notice that his toes were congested. Discoloration of the skin between the

toes became very marked by December, 1955, and in the next month one ulcer began between the first and second toes and another on the dorsum between the fourth and fifth toes. Since then he had been resting with the leg elevated for two months, and the ulcers were healed on admission to hospital.

Examination showed him to be a well-built man with 2 in. (5 cm.) real shortening of the left leg. The leg was in good position with no fixed flexion deformity. The only movement possible in the hip was 30 degrees flexion and 10 degrees abduction. There was a well-healed osteotomy scar. Below the knee the leg was swollen and showed many superficial varicosities. Areas of healed ulceration with supple scars were seen above the lateral malleolus, between the first and second toes, and on the dorsum of the foot. Dorsalis pedis and posterior tibial pulsation was present on both sides. The temperature of both feet was the same. The valves in the dilated superficial veins were incompetent, showing rapid retrograde filling. The application of a tourniquet to prevent superficial venous return was tried and the leg then exercised (Perthes's test). There was some discomfort and congestion of the leg with the tourniquet around the mid-thigh; painful congestion was marked when it was applied around the knee, but with the tourniquet at the mid-calf level the leg could be exercised with comparative comfort.

Investigations.—Phlebography was performed (Fig. 1) by injecting 70% diiodone into the long saphenous vein on the dorsum of the foot. A tourniquet had been applied above

FIG. 1.—Venogram showing narrow recanalized popliteal vein. Left-hand film, taken after Valsalva manoeuvre, shows normal vein above obstruction and retrograde filling of veins from gastrocnemius.

the ankle to occlude the superficial veins, and a crepe bandage from the ankle to the groin to keep all the superficial veins above empty (Muir *et al.*, 1954). Screening and films showed marked narrowing of the popliteal vein at the level of the tibial condyle due to recanalization of the thrombosed segment. No deep anastomotic channels are seen.

Interpretation and Treatment

The narrowing of the deep veins appeared to be confined to the popliteal vein, so that blood returning from the foot had either to pass through this narrowed segment or to

return via the superficial veins. It was thought that by applying an elastic bandage up to the knee, and so occluding the superficial venous "by-pass," the return of blood from the leg and foot was impaired, and that the congestion led to discoloration and ulceration below the elastic support—that is, on the dorsum of the forefoot and toes. That some sort of support around the ankle at the site of the perforating veins was required had already been seen, as malleolar ulceration had once occurred. It was therefore decided to apply support up to the mid-calf, as suggested by the Perthes test, in the hope of allowing blood to flow past the narrowed popliteal vein through perforating and superficial veins. Elastic bandaging to this level seemed comfortable, but was difficult to keep in place. A mid-calf elastic stocking was therefore made with a bone support to prevent its slipping down (Fig. 2).

The patient was discharged and returned at once to his work. Nine months later he remains comfortable and there is no sign of ulceration or of increasing skin pigmentation, either on the foot or above the upper limit of the stocking. It is too early yet to say that ulceration will be prevented, but the patient is comfortable and says he experiences none of the congestion that he felt before when supported up to the knee.

NOTE.—The phlebogram showed that the veins above the narrowing were of normal calibre and had competent valves; it is, however, interesting to observe the way in which the otherwise normal femoral vein has been "concertinaed" owing to the shortening of the limb caused by an osteotomy (see Special Plate).

FIG. 2.—Half calf-length elastic stocking with "bone" supports.

Summary

A patient with popliteal-vein thrombosis developed ulceration above the lateral malleolus, which was treated successfully with an elastic bandage. Although the first ulcers healed, severe ulceration began on the dorsum of the forefoot and in the interdigital spaces.

Interpretation of the physical and radiological signs led to the construction of a mid-calf-length elastic support, which has proved successful so far for nine months.

I should like to thank Mr. A. J. H. Rains for his permission to publish this case.

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The Central Middlesex Research Prize for 1958 has been awarded to Dr. DAVID PHEAR.