deepened to healthy tissues, it will usually be possible to apply immediate split-skin grafts. After two weeks further grafts may be advisable.

In spite of the use of the methods outlined, final healing of extensive lesions often takes three months. With experience this time can be reduced to a minimum. When final healing does occur the skin is often puckered and scarred. This may be so severe that a flap or pedicle graft is required, especially if any further operation becomes necessary in the involved area. In this short series, two feet have required cross-leg flaps for this reason.

Summary and Conclusions

The open and closed varieties of friction injuries sustained in road accidents have been described and the importance of careful treatment has been stressed.

The open lesion is quite common, but good judgment is of great importance in its management. The antibiotics have made surgical treatment and early skin-grafting safer.

The closed lesion is rarer. If it is not recognized early, skin gangrene may be found when a plaster is removed. Medico-legally, it is important to realize that bandaging and splintage have in no way been responsible.

The cases were treated in the traumatic units of Liverpool Royal Infirmary and the Nottingham Children's Hospital. My thanks are extended to Mr. Norman Roberts for permission to publish the two cases illustrated. I also wish to acknowledge the helpful guidance of Mr. A. N. Birkett, under whose care most of the cases were admitted. (Fig. 1 was taken by the photographic department of the General Hospital, Nottingham, and Fig. 2 by the Central Photographic Department of the University of Liverpool.)

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DISOBLITERATIVE ENDARTERIECTOMY OF THE EXTERNAL ILIAC ARTERY

BY

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Case Report

A man aged 68 was referred to hospital on April 27, 1951, complaining that a month previously he had had a sudden pain in the right calf while walking. Subsequently he had cramp-like pain in the right calf which compelled him to halt after walking a distance of 300-400 yards. The pain was quickly relieved by rest. At the same time the right foot became cold.

On examination his general condition was good. His blood pressure was 140/80. The general appearance of the right lower limb was normal. The right foot was colder than the left. The pulse could not be felt in the right external iliac artery or in any of the arteries of the right leg. On the left side the external iliac, common and superficial femoral, popliteal, posterior tibial, and dorsalis pedis arteries pulsated strongly. The oscillometric index in the right thigh was $2\frac{1}{2}$ and in the right calf $1\frac{1}{2}$, as compared with $8\frac{1}{2}$ and 9 in the left thigh and calf respectively. A clinical diagnosis of thrombosis occluding the right external iliac artery was made. A plain x-ray film of the abdomen and lower limbs showed slight calcification in the walls of the lower abdominal aorta, but none in the arteries of the legs.

Aortography on June 26 showed an obliteration of the external iliac artery from its origin extending down as far as 1 cm. or so above the bifurcation of the common femoral

artery. Filling of the main vessel below the obliteration was through numerous collaterals derived from the branches of the internal iliac artery.

Operation

On July 5, under general anaesthesia, the iliac vessels were exposed extraperitoneally and the incision was continued across Poupart's ligament to expose the common femoral artery. The external iliac and common femoral arteries were pulseless. Clamps were placed on the common and internal iliac arteries and on the femoral artery below the obliteration. The external iliac artery was incised to a depth sufficient to expose the yellowish necrotic inner coat adherent to the contained thrombus. An easy plane of cleavage was found here between the inner and outer layers of the arterial wall and developed over the full length of the obliteration. Disobliterative endarterectomy was completed by severing the inner arterial coat at each end of the thrombus (see photograph). Free bleeding then occurred from each end. After tightening the clamps the 12-cm. longitudinal incision was closed with a continuous suture of 00000 black silk. On release of the clamps pulsation was seen and felt throughout the previously inert external iliac artery and in the femoral artery beyond the previously obliterated segment. At several points along the suture line a pulsatile leak of blood required supplementary interrupted stitches.

Intravenous heparin was given throughout the operation to lengthen the clotting-time between 15 and 30 minutes, and the interior of the artery was irrigated with heparin during the suture.

Post-operative Progress.—The patient made an uninterrupted recovery. The wound healed by first intention. There was no post-operative haemorrhage. He was discharged from hospital on July 26.

When seen on September 6, nine weeks after the operation, the patient was walking normally. He said he could do so at a slow pace for an unlimited distance without any cramps, though these still occurred in a mild form if he hurried. He had completely lost the sensation of coldness in the foot, and is fully satisfied with the result of the operation. On examination both feet were equally warm. Pulsation was palpable, though of small volume, in the right external iliac and common femoral arteries, and very faint pulsation was felt in the popliteal artery. It could not be detected with certainty in the posterior tibial and dorsalis pedis arteries.

Comment

The technique of disobliterative endarterectomy employed in this case is that devised by Reboul in 1947 and a modification of that first employed by Dos Santos (Reboul and Laubry, 1950). Its essential feature is that the endarterectomy is performed under direct vision through a longitudinal incision which opens the artery over the whole extent of the thrombosed segment. In this way complete removal of the obstruction is possible with the least risk of injury to the remaining coats of the artery. The vessel is left with a perfectly smooth inner surface, and the likelihood of re-obliteration by post-operative thrombosis is thus minimized. This contrasts with the blind removal of the obstruction through multiple small arteriotomies in Dos Santos's original method.

Orthodox methods of surgical treatment of arterial thrombosis aim at promoting the collateral circulation by interruption of sympathetic pathways, either centrally by ganglionectomy, or peripherally by arteriectomy of the thrombosed

Photograph of operation specimen. At the lower end a part of the central thrombus is exposed where its sheath of internal arterial coat is defective.

segment. This is often successful, even in the senile obliterations, in improving the vegetative state of the limb and so protecting against gangrene. Its effect on intermittent claudication—the commonest disabling symptom—is much more uncertain. In many cases no improvement in the claudication follows an otherwise satisfactory sympathectomy. Some of the results of disobliterative endarteriectomy suggest that this may have a more direct effect on claudication than can be achieved by dilatation of the collateral vessels. Thus in one of my cases claudication was completely relieved by endarteriectomy of the femoral artery several months after a lumbar ganglionectomy which had had no effect on this symptom. In another case, with bilateral claudication, a lumbar sympathectomy was performed on one side and a femoral endarteriectomy on the other (Forty, 1951). The relief of the claudication was much greater on the side treated by endarteriectomy.

An essential preliminary to disobliterative endarteriectomy is a good arteriogram demonstrating a localized thrombosis in a main artery with a permeable lumen beyond it. In these circumstances the operation is indicated, provided that the patient's general condition warrants a longish intervention under general anaesthesia, with special reference to the risk of post-operative coronary or cerebral thrombosis in elderly arteritic persons. Cerebral thrombosis 10 days after operation caused the one death in my personal series of eight disobliterative operations.

Severe haemorrhage from the wound may result from the administration of heparin. In one of my cases of disobliteration of the whole length of the femoral artery and beginning of the popliteal artery the wound had to be reopened five hours later because of severe bleeding. The femoral artery was seen pulsating well at the bottom of the wound, and the suture line was intact. The haemorrhage was due to capillary oozing from the muscles and fasciae, and was controlled by packing. Secondary suture of the wound, performed four days later, was followed by good healing and a satisfactory functional result.

Summary

A case of successful disobliterative endarteriectomy of the external iliac artery is reported.

The technique, indications, and complications of the operation are briefly discussed.

My thanks are due to Miss M. H. Shaw for the photograph.

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Cambridge University Press has published *Alumni Cantabrigienses* (vol. 4, part 2) a biographical list of students, graduates, and holders of office at the University from the "earliest times" to 1900. Biographies are necessarily short, but many entertaining details emerge (*Nature*, July 26, p. 131). A high proportion of members went into the Church; the Rev. Edward Kempe is said to have left behind him a ton of unpreached sermons. Diplomat Henry Labouchere contracted a debt of £6,000 in two years at Cambridge, joined a circus, lived in a Red Indian camp, was dismissed from the diplomatic service for impertinence to Lord John Russell, became an M.P., and then a successful journalist working for the *Daily News* and *Truth*. About 90 Fellows of the Royal Society are mentioned; other famous scientists include Le Verrier, Lister, and Sir John Murray. A large number of graduates were Fellows of the Society of Antiquaries—the Earl of Crawford, for instance, founder of Dunecht Observatory, who went to Mauritius to observe the transit of Venus in 1874. Another who travelled far from Cambridge was James Losh, who went to Paris to study the French Revolution and had his life saved by Marat, who had been a practising physician in London. On his 103rd birthday C. F. L'Oste, who had never consulted a doctor, went up in an aeroplane.

CONGESTIVE SPLENOMEGALY DUE TO PANCREATIC CYSTADENOMA

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Cystadenoma of the pancreas appears to be an uncommon condition, to judge by most publications. Not all authors agree to this, however: Haukohl and Melamed (1950) point out that, while they could find only 63 authentic cases in the literature, many others were "buried in reports on pancreatic surgery, hidden in discussion of wholly unrelated non-neoplastic conditions, or reported under a variety of erroneous diagnoses." Study of the available literature indicates that most of the recorded cases presented as problems in surgical or radiological diagnosis, because of either abdominal pain or a palpable tumour.

We should like to add another case, not only because of the uncommonness of the condition but also on account of the nature of the symptoms which have not previously been noted.

Case Report

The patient was a woman aged 39, who was first seen by us in October, 1947, when she was admitted after a severe haematemesis. She said she had vomited blood for the first time in 1939, when a diagnosis of peptic ulcer was made; and she had had melaena nine months before admission. Apart from these episodes her only other complaint was of intermittent vague epigastric discomfort which bore an inconstant relationship to food. Her appetite was good and she had not lost weight.

On examination she was pale and moderately shocked; there was a little tenderness in the epigastrium. The spleen was readily palpable below the left costal margin. The lungs and cardiovascular system were normal apart from a blowing systolic murmur at the apex of the heart. A blood count showed: haemoglobin, 42% (Haldane); red cells, 2,300,000 per c.mm.; white cells, 5,000 per c.mm. (polymorphonuclear 84%, lymphocytes 15%, monocytes 1%); the film showed moderate anisocytosis and abundant platelets. One pint (570 ml.) of group O rhesus-negative blood was transfused as an emergency measure; subsequently she responded well to oral iron. Bleeding and coagulation times and red-cell fragility were normal. No abnormality was found in the bone marrow apart from rather overactive haemopoiesis. The van den Bergh reaction was negative, and there were no abnormal urinary pigments. Films of material obtained by spleen puncture did not reveal any pathological tissue. Fractional gastric analysis showed moderate hypochlorhydria; barium swallow and meal failed to demonstrate oesophageal varices or ulceration in the stomach and duodenum.

The patient was discharged after six weeks in hospital with a diagnosis of congestive splenomegaly; the haemoglobin level was 84% (Haldane). Between October, 1947, and August, 1949, she was admitted to hospital six times—on four occasions with haematemesis, once with melaena, and once because of lassitude and lack of energy resulting from prolonged occult bleeding in the gastro-intestinal tract. Her condition at these times varied; blood transfusion was