SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

ABRASIONS AND CONTUSIONS

BY

R. J. McNEILL LOVE, M.S., F.R.C.S.

An abrasion as such is of little moment, but it may be of supreme importance in that solution of continuity of skin or mucous membrane is apt to allow the entry of organisms into the tissues. Theoretically even the smallest abrasion should be treated with promptitude, and treatment maintained until the wound is soundly healed. In practice, however, small abrasions are often considered to be such trivial injuries that they are apt to be neglected, or at the most receive a "dab of iodine." Members of the medical profession who are exposed to the risk of virulent infections, especially pathologists and surgeons, are sometimes sufficiently careful to protect an abrasion from infection, but even among our own profession tragedies occur from time to time. The organisms which may gain entry through an abrasion fall into two groups—namely, non-specific, or pyogenic, and specific.

Non-specific Infections

Various strains of staphylococci and streptococci commonly affect the tissues in the region of a neglected abrasion. Staphylococcal infections are usually localized, and if suppuration occurs the pus is thick and creamy. Streptococci, on the other hand, are apt to cause a rapidly spreading inflammation, and any pus which may form is scanty in quantity and seropurulent in nature. It is of importance, especially in connexion with treatment, to remember that organisms which have gained entry through an abrasion may spread by any of the following routes: (1) by continuity, which mode of spread is most in evidence when virulent organisms, especially streptococci, infect loose connective tissue, such as the subaponeurotic space under the scalp, or subcutaneous tissues; (2) by lymphatic channels, when red streaks may be seen denoting acute lymphangitis, going on to enlargement and tenderness of the regional lymphatic glands, which may subsequently suppurate; (3) by the blood stream, some degree of toxæmia being expected if the infection is of moderate severity, while if the invading organisms are virulent or the resistance of the patient is low, septicaemia may follow, or even pyæmia with associated metastatic abscesses.

Specific Infections

Probably the specific organism most to be dreaded is the *B. tetani*. Abrasions contaminated by cultivated soil are particularly dangerous, but those associated with street accidents are less prone to be infected with tetanus than formerly, owing to the diminishing numbers of horses now employed. Nevertheless, any patient who has sustained an abrasion of sufficient depth or so contaminated as to be potentially infected must be given an intramuscular injection of 1,000 international units of anti-tetanus serum. Some calcium preparation should be given orally for a few days, so as to prevent or minimize serum reaction—this applies to the administration of any serum. Among the other specific organisms which may gain entry through an abrasion is the *Spirochaeta pallida*. Prophylactic treatment, such as washing with potassium

permanganate solution, 1 in 1,000, and the subsequent application of 30 per cent. calomel ointment, practically guarantees freedom from infection.

Hydrophobia is due to infection of an abrasion, usually at the time of infliction, but occasionally inoculation follows the licking of an abraded area by an infected animal. If infection is suspected the wound should be treated immediately by the actual cautery, or by a strong caustic such as pure carbolic acid, which is less painful owing to its local anaesthetic properties. If reasonable grounds exist for presuming that the offending animal was suffering from rabies, then the patient is sent without delay to an institute where he can receive Pasteur treatment. As the incubation period in man is rarely less than two months, ample time is available for the journey to a recognized centre.

The anatomical tubercle (verruca necrogenica) is a further example of the danger of inoculation of an abrasion. This condition occasionally occurs in butchers and others who are exposed to inoculation by tubercle bacilli. A warty excrescence presents itself, usually on the back of the hand. The most expeditious treatment is by excision.

Treatment of Abrasions

An abrasion should be treated by suitable dressings until it has completely healed and all risk of infection has disappeared. This applies particularly to patients who are exposed to irritants, such as chemical workers, and to medical practitioners, nurses, or undertakers, whose occupation subjects them to the risk of inoculation by organisms. During the first few hours, when the abrasion is still clinically uninfected, the application of a mild antiseptic is all that is required locally. Tincture of iodine (B.P., 2½ per cent.) is commonly applied as a first-aid expedient, but such a strong antiseptic is liable to do more harm than good, as it devitalizes the tissues and renders them less resistant to infection. This is especially so in those cases in which a few hours' delay has allowed organisms to enter the wound. Therefore, except possibly as an immediate application to a small abrasion, tincture of iodine is not to be recommended. More suitable applications are surgical spirit, aqueous solution of flavine (1 in 1,000), or eusol, which must be fresh and applied cold. The antiseptic property of eusol depends mainly upon the presence of chlorine, which is readily driven off if the solution is heated. Other suitable antiseptics are lysol, and its allied preparations, in 1/2 per cent. solution, or dettol. Friar's balsam (tinct. benzoini co.) is a popular and efficient application. Any of these antiseptics, except eusol, is applied once or twice daily. A eusol dressing should be changed three times daily, as its antiseptic properties rapidly deteriorate. If the abrasion is contaminated with soil, gravel, or dirt an anaesthetic is sometimes desirable, so that the wound can be thoroughly cleansed and ragged skin removed, or the edges excised. A general anaesthetic is usually required for children, and in the case of adults evipan or an allied preparation is very satisfactory.

If infection develops treatment is directed to localizing the inflammation, as a spreading cellulitis may cause a long and anxious illness and even terminate fatally. The first essential is rest to the affected part. A sling should

be applied if the upper limb is involved, and in the case of the trunk or lower limbs confinement to bed for a few days is desirable, except in the mildest cases. A detailed description of the treatment of cellulitis is beyond the scope of this article, but the frequent application of hot hypertonic saline solution (1/2 oz. of salt to 1 pint of water) by means of either immersion or hot compresses is an excellent method of treatment. Abrasion of the knees in children ("gravel rash") is not uncommonly followed by some degree of cellulitis, which is apt to result in a sympathetic effusion into the knee-joint. Doubt may exist as to whether the effusion is serous or purulent, but in the former case a few degrees of painless movement is possible, whereas suppurative arthritis causes intense spasm, and severe pain is experienced at any attempt to move the joint. If a diagnosis cannot be made in any other way a needle should be inserted through healthy skin and a small quantity of fluid withdrawn for examination. In the case of inflammation following an abrasion giving rise to adenitis of the regional lymphatic glands the timely application of antiphlogistine or kaolin tends to avert suppuration. The general health must also receive consideration, sedatives, aperients, stimulants, or tonics being ordered as necessary. If the infection is streptococcal in nature, then sulphanilamide should be prescribed.

Abrasions of Special Organs

Abrasions of the alimentary canal are worthy of mention; scratches or abrasions due to a fish-bone or other sharp object are common events in general practice. The patient usually insists that the sharp object is still *in situ*. If he locates the site of injury to the mouth or pharynx a careful inspection must be made, in order to confirm its presence or else to disprove his statement and reassure him. Special attention is paid to the tonsillar fossae, as a small fish-bone embedded in the tonsil is readily overlooked. If the patient says that a small foreign body is "sticking in the gullet" he should be reassured and directed to feed on pulque food, and it may be justifiable to prescribe some harmless medicine or a mild bromide mixture as a placebo for a nervous patient. If the symptoms persist for more than twenty-four hours an oesophagoscopy should be performed, as the patient may be correct! I have seen death result from ulceration of a fish-bone through the wall of the oesophagus into the arch of the aorta, and cases of mediastinitis are occasionally reported. The old-fashioned probang should not be used unless it is impossible to obtain the services of a surgeon familiar with oesophagoscopy. A cotton-wool sandwich may be of assistance occasionally. A thin layer of cotton-wool is sandwiched between two pieces of well-buttered bread, and the patient is asked to eat this. Some of the cotton-wool does tend to collect round the fish-bone or other foreign body, and may diminish the possibility of its injuring or penetrating the gut. Occasionally abrasions of the other end of the alimentary canal are also fraught with danger. An enema syringe with a rigid nozzle should never be used unless a rubber catheter is attached, otherwise it may abrade or even perforate the wall of the anal canal or rectum. Such abrasions have been followed by cellulitis of the wall of the bowel, which in some cases has spread to the pelvic cellular tissue with fatal results.

Abrasions of the cornea always require careful attention so as to avoid the development of a scar, which, if situated centrally, will impair vision, and in any case will persist as an ugly reminder. Two or three drops of castor oil and a pad and bandage for twenty-four hours is usually

adequate treatment. Lead lotion should never be applied to skin abrasions in the region of the orbit unless it is quite certain that no corneal abrasion exists, otherwise lead albuminate forms over the abraded area and remains as a permanent corneal opacity.

Contusions

The term "contusion" implies laceration of and haemorrhage into subcutaneous tissues or deeper structures, following an external injury but unassociated with any wound of the skin. The clinical features of a subcutaneous contusion are pain, which occurs immediately, ecchymosis, which follows shortly, and swelling, the extent of which depends upon the severity of the injury and the laxness of the damaged tissues. Pain varies with the extent and site of the injury. Contusion of tissues which can accommodate a considerable extravasation of blood, such as the scrotum, is comparatively painless, whereas a contusion of the auricle is usually somewhat painful. Ecchymosis, or bruising, is due to infiltration of the tissues with blood, and if extensive the overlying skin may be almost black in colour. This is especially noticeable when the injury affects lax tissues in which oozing readily occurs, as, for example, when injury to the circumorbital region results in a "black eye." In some cases the blood extravasates along the fascial planes and appears at a distance from the site of injury; thus, a blow on the skull is apt to damage subaponeurotic vessels, and bruising may appear some days later in the eyelids or in the region of the mastoid process.

In the case of severe contusions a haematoma may form and present itself as a fluctuant or boggy swelling. As a rule serum collects in the centre while fibrin is deposited in the periphery, and eventually the haematoma is absorbed. At this stage a subpericranial haematoma closely simulates a simple depressed fracture of the vault, as on palpation the edge of the clot resembles the rim of bone surrounding a depressed area of the skull. However, the clot can sometimes be indented by the finger-nail, and in the absence of intracranial complications delay of a few hours is of little moment, so a radiograph can be taken in order to distinguish the two conditions. Occasionally a haematoma persists as a permanent swelling, which consists of a sac containing serous fluid and surrounded by laminated fibrin, which later is organized into fibrous tissue. Haematoidin crystals, derived from blood pigment, are commonly found in the wall of this so-called "blood cyst." If the history of injury is forgotten by the patient a blood cyst is a fruitful source of errors in diagnosis.

A common complication of contusions, associated with either extravasation of blood or a haematoma, is infection. The organisms gain entry either through a coexisting abrasion, or are blood-borne from some focus of infection such as the tonsils or teeth, or from distant cutaneous lesions. The advent of suppuration is indicated by increased swelling, heat, and constitutional disturbances. The swelling associated with a contusion is due primarily to oozing from small blood vessels. The blood which escapes subsequently clots and excites an aseptic inflammatory reaction. If the nutrition of the underlying skin is impaired thereby blebs or blisters are apt to develop, a condition which not infrequently complicates the treatment of fractures of the tibia.

Treatment of Contusions

The treatment of a contusion is directed first of all towards limiting the amount of oozing from ruptured

capillaries and small vessels, and so controlling the extravasation of blood and preventing the formation of haematomata. The first essential is again rest to the affected part, either by the limitation of activities, splinting, or confinement to bed. The application of cold in the form of an ice-bag or suitable lotions, such as lead lotions or surgical spirit, is valuable. The traditional raw beef-steak for contusions of the orbit is an example of a cold application. In some cases pressure by means of a bandage, perhaps soaked in cold water, will limit extravasation, but care must be taken not to interfere with the circulation of the affected part.

The majority of haematomata require no surgical intervention, but a timely incision is occasionally needed to relieve tension and evacuate blood clot when a contusion results in the extravasation of the blood or the formation of a haematoma in a confined space. A classical instance is contusion of the muscles of the forearm, which are enclosed in an inelastic fascial compartment. Extravasated blood causes an abnormal tension in this confined space and consequent impairment of venous circulation. Neglect or delay in incising the deep fascia of the arm may cause lifelong disability in the form of Volkmann's ischaemic contracture. In some situations an ugly mass of organized blood clot is apt to persist if the haematoma is treated conservatively—the "cauliflower ear" which follows an untreated contusion of the auricle is a good example. This can be prevented by a small incision, evacuation of the serum and recent clot, and the application of a firm elastoplast dressing.

Contusions of deeper structures, such as the brain or lung, are beyond the scope of this article, but a few words may be added in connexion with the abdominal organs. A contusion of the liver is suspected rather than actually diagnosed. The site of injury, possible association with a fracture of the lower ribs on the right side, a moderate degree of shock, and local tenderness all suggest the nature of the injury. A constant pulse reading indicates that progressive haemorrhage is not occurring, and two or three days later suspicions of a contused liver are sometimes confirmed by the appearance in the urine of bile, which has escaped from ruptured biliary capillaries and which is subsequently absorbed by the blood stream. Very occasionally a circum-umbilical patch of jaundice appears, due to the extravasation of bile into the cellular tissue overlying the bare area, and absorption of bile pigment by the lymphatics which accompany the ligamentum teres. The treatment of a suspected contusion of the liver is expectant; omnopon is given (morphine is unnecessary in the absence of severe pain, and is apt to cause vomiting and alimentary derangement) and an ice-bag applied over the site of injury. A careful watch is kept on the pulse, so that continued haemorrhage may be readily recognized, and more energetic treatment instituted if necessary.

Contusion of the kidney is diagnosed by haematuria following trauma in the kidney region, and occasionally an indefinite swelling is palpable in the loin, due to extravasation of blood and urine. Every specimen of urine should be saved and compared with previous ones, so that some idea can be gained as to whether the bleeding is subsiding or persisting. Omnopon is given and an ice-bag or cold pack applied to the renal region. Urinary antiseptics are said to prevent the development of a perinephric abscess, which is a common complication of a contused kidney. If haematuria is persistent, or if the pulse rate rises, operative intervention should be considered, in order either to repair or remove the kidney.

CONGRESSES ON RHEUMATISM AND HYDROLOGY

The Oxford Meeting

The International Congress on Rheumatism and Hydrology, which is to be held in Oxford, with preliminary entertainment in London, from March 25 to 31, is being convened jointly by the International Society of Medical Hydrology and the International League against Rheumatism.

The president-elect is Sir Farquhar Buzzard, Regius Professor of Medicine at Oxford; the chairman of the British Organizing Committee is Sir Humphry Rolleston, and the office of the congress is c/o the International Society of Medical Hydrology, 109, Kingsway, W.C.2.

There will be two main subjects for discussion. "Wet and Dry Climates and Weather in the Causation of Disease" will be introduced by Professor G. Danischewsky (U.S.S.R.), Dr. G. Edström (Sweden), Professor de Rudder (Germany), and Dr. E. P. Poulton (Great Britain). The second subject, "Juvenile Rheumatism," will be considered under four aspects, the principal speakers being: *Pathological aspect*: Professor F. Klinge (Germany) and Dr. A. G. Gibson (Great Britain). *Clinical aspect*: Professor L. Findlay (Great Britain) and Dr. H. Grenet (France). *Therapeutic aspect*: Dr. Wilfrid Sheldon (Great Britain) and another opener. *Social aspect*: Dr. F. J. Poynton (Great Britain) and Professor G. Danischewsky (U.S.S.R.). There will be numerous supplementary papers to the discussion on juvenile rheumatism, and it is hoped that supplementary papers will also be received for the first subject.

Visits are to be paid to hospitals in London on March 26, and there will be receptions on the evenings of the 25th and 26th. Arrangements are being completed for the accommodation of congress members in colleges at Oxford; a concert, banquet, and reception have been arranged there; visits will be made to Leamington Spa during the meeting and to Droitwich at the end.

The congress is open to medical men and scientists who are not members of either body on payment of a congress fee. All inquiries should be addressed to the General Secretary, International Congress on Rheumatism and Hydrology, 109, Kingsway, London, W.C.2.

The Bath Meeting

The Bath Congress on Chronic Rheumatism is to be held to commemorate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases on March 31, April 1, 2, and 3. It will follow directly after the International Congress at Oxford. The meeting will be opened by Lord Horder on the evening of Thursday, March 31, and his address will be followed by a mayoral reception and dance. The next day will be devoted to a discussion on "Gout and Rheumatism of Metabolic Origin," and papers will be read by Sir Walter Langdon-Brown, Professor Weil, and Drs. Hill, Gibson and Kersley, Weissenbach, and Francon, the discussion being resumed by Drs. Geronne, van Breeman, Kahlmeter, and Freund. There will be a banquet in the evening. On Saturday, April 2, papers will be read by Professor Pemberton, Professor Hench, and Professor Davidson. The following morning a demonstration of cases will be given at the hospital.

The meeting will be open to all practitioners, and further particulars may be obtained from the honorary secretary, c/o the Bath Royal National Hospital for Rheumatic Diseases.

The Middlesex County Council on December 21 adopted proposals for a large increase of hospital accommodation in the county, and for the provision of seaside convalescent homes near Southampton and at Mundesley, Norfolk. The sum of £658,000 will be spent on extending the West Middlesex County Hospital, Isleworth, and £650,000 on extending the Hillingdon County Hospital, Uxbridge.