- (a) The needle is light.
- (b) The distance between the mount and the flange is short.
- (c) The flange is immovable, and so the extra weight of a screw mechanism is avoided. The least possible movement of the needle in the cortical bone is thus allowed and this junction remains firm.
- (d) Four different lengths of needle below the flange have been made: 1/4 in., 3/8 in., 1/2 in., and 5/8 in. Size 18 s.w.g. is suggested for the two smaller; size 16 or 17 s.w.g. for the larger. The 1/4-in. size is suitable for premature infants and neonates; the 1/2-in. and 5/8-in. for about 5-year-old children or over. But the length of needle used should be according to the size of the child and the amount of subcutaneous fat.
- (e) Each needle has its own stylet.
- (f) There is one handle for the set, which can be screwed on to the stylet in order to get a good grip during insertion of the needle.
- (g) The right-angled adaptor, with the strut to keep it firmly in position, leads the tubing along parallel to the limb. The rubber strip attached to the base of the strut is strapped round the limb. Occasionally, owing to fat or oedema or some other irregularity of contour, the strut on the adaptor seems too long and will not sit on the leg and in the needle satisfactorily. An adaptor without a strut is therefore supplied in each set. The tubing should be fixed in two places with strapping—to the limb and to the splint; the splint should extend 4 in. to 6 in. beyond the foot.

Technique of Insertion

The place chosen on the tibia is the flat subcutaneous plate of bone inferior and medial to the anterior tibial tuberosity. This area is well below the epiphysal line, above the nutrient artery, and there are no important anatomical structures to which damage might be done between the skin and bone. It will be remembered that a cross-section of the tibia is roughly triangular. A non-touch technique is maintained so far as is possible, as during any operation involving bone.

1. The limb is splinted in a semi-externally rotated position (as for cutting down on to the internal saphenous vein at the ankle).
 2. The skin is cleaned. Local anaesthesia of the skin, subcutaneous tissue, and periosteum is given with 1% novocain. The area is massaged to disperse the anaesthetic, and the anterior and medial borders of the tibia are palpated.
 3. The needle and stylet, with the handle attached, are taken and, with the needle at right angles to the plate of bone—i.e., pointing postero-laterally with reference to the leg itself—are inserted with a firm twisting motion as when using a bradawl. The needle passes through the cortical bone with a crisp crunch. The flange rests lightly on the skin.
 4. When the stylet is withdrawn a small amount of marrow may well up or be sucked up into a syringe; it seldom flows out freely.
 5. The adaptor, filled with the transfusion fluid and attached to the tubing from the dripper and bottle (which has already had air bubbles excluded), is fitted to the needle and the flow started.
- Fig. 3 shows the arrangement for transfusion through the bone marrow of the tibia.

FIG. 3.—Close-up of the arrangement for transfusing through the tibia in the case of a 3-months-old boy with bilateral mastoiditis.

Any of the usual transfusion fluids may be given in this way—saline, Hartmann's solution, blood, serum, or plasma. When using blood it is often necessary to increase the pressure by raising the bottle as much as six feet above the needle; or, alternatively, the blood may be diluted. The constant rate

of drip which can be maintained is usually remarkable; the rate required is adjustable by a screw clip on the tubing. The older the child the larger the marrow cavity and therefore the faster the flow can be. The longest time one transfusion has been maintained was six days. When the needle was taken out it was still firmly held in the bone, and there was no reason to suppose that the transfusion could not have been continued had it been necessary.

Particular attention might be paid to the following points:

Emphasis is laid on the necessity for inserting the needle at right angles to the surface of the tibia. This is facilitated by the position of semi-external rotation of the limb. The diagram (Fig. 4) shows the error of attempting to insert the

needle in the antero-posterior direction of the limb, as might happen if the leg were not fixed in the correct position. It is probably wise to inject a small amount of saline through the needle as soon as it has been inserted, to ensure that the marrow has been entered satisfactorily. The adaptor can then be securely connected.

If the needle does work loose, fluid will leak back into the subcutaneous tissues and the limb will become oedematous; the transfusion must then be stopped. A careful watch for oedema should be kept during the first hour or two of the transfusion, because, if oedema is allowed to develop, a pressure necrosis of the skin beneath the flange might result.

Dislodging by kicking with the other leg can be prevented by anchoring it with a bandage noose round the ankle. A small cradle will prevent disturbance by the bed-clothes.

If a second transfusion is required soon after the first has been discontinued the other tibia must of course be employed, as leakage back through the original hole will make that leg impracticable.

It would seem wise to reiterate the need for strict asepsis, since osteomyelitis, though it remains theoretical, is the haunting danger.

The procedure can be facilitated by giving a feed or an appropriate dose of chloral hydrate; these will quiet the baby and often surprisingly help the initial stages of the transfusion.

I want to thank Dr. Donald Paterson and Mr. T. Twistington Higgins for their interest, and Dr. King Lewis for his encouragement and suggestions. The needle and attachments have been made by Messrs. Allen and Hanburys Ltd.

REFERENCE

Bailey, Hamilton (1944). *British Medical Journal*, 1, 181.

"CELLOPHANE" FOR THE TREATMENT OF BURNS

BY

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Since Davidson's communication in 1925 many other observers have contributed to the literature on the treatment of burns. Usually their methods have had at least two factors in common: first, the exclusion of air, to promote the patient's comfort and to diminish shock and infection; secondly, to allow epithelization to proceed undisturbed by frequent and painful dressings. Within the last three years some observers have emphasized the similarity between the pathology of a burn and that of other wounds, and have reiterated the harm of tissue irritants in the toilet of the burn and demonstrated the value of firm pressure upon the area to support the damaged vascular bed. In the American literature the application of these principles has come to be known as the "cleansing, rest, and compression" treatment of burns. The

work of Allen and Koch (1942) and Siler (1942) has been especially convincing, and their results compel a trial of their methods.

A modification of this form of treatment has been employed in 10 consecutive admissions to a general hospital. The modification advocated is the use of an occlusive dressing medicated with sulphanilamide through which the burned area may be easily inspected. This is achieved by the use of "cellophane" and unguentum sulphanilamidi. The number of cases is unfortunately very small, and there has been no investigation of the blood chemistry or viscosity in the cases studied. All the burns were of the second degree, the average stay in hospital was about 21 days, and all the patients returned to duty. The results have been so uniformly successful that it is thought that a description of this form of treatment will be of value, especially now when the transportation of burned Service personnel presents such problems in the prevention of shock and infection. The use of "cellophane" as a splint for Thiersch grafts has been described by Poth (1942); Ellis (1943) recommends using this material as a dressing for tropical ulcer; but in the literature at my disposal it has not been mentioned as a dressing for burns.

Local Treatment of the Burned Area

Using general anaesthesia, the intact skin surrounding the burned area is thoroughly cleaned with white soap and water, and then the toilet of the actual burned area is meticulously carried out. The importance of gentleness and the use of normal saline in irrigating the burned area has been sufficiently stressed in the original papers, but it is well always to remember that "in any burn the vascular bed of the area has been seriously affected."

The medicated sheets of "cellophane" are then applied so that each overlaps the other for about an inch. These sheets adhere to one another and to the intact skin, and the entire burn is embraced in an envelope that permits of easy inspection and prevents contamination. Next, perforated oiled silk is wrapped around the "cellophane." This is not essential, but does help to prevent the wool (which is what we have had to use for compression) from adhering to the dressing and tearing it when removed. The use of sea sponges for compression would probably make such a precaution unnecessary. A firm bandage completes the dressing. After 48 hours the burn is inspected. The "cellophane" may be in some parts blistered by collections of serum. Any such bullae are trimmed away with scissors, and the area affected gently cleaned with saline swabs and another sheet of "cellophane" applied. This transparent dressing adheres lightly to healed burned areas, but if carefully removed does not damage the delicate new epithelium. However, no attempt at removal should be made until it begins to separate itself. The "cellophane" does not adhere to the unhealed areas, so that damage to the tissue, if the dressing must be changed, is minimal.

If the case is received so late that the burn is already frankly infected, a nicety of surgical judgment is demanded. One may try to convert an infected wound into a relatively clean one by prolonged and gentle irrigation (Bisgard *et al.*, 1942) and then rely on the bacteriostatic action of the sulphanilamide to keep the burn clean. Or saline compresses or a Bunyan-Stannard envelope (if available) may be used for 48 hours and the burn then again closed in the "cellophane" envelope.

Some of the patients in this series have arrived many hours after the burn was received and after a prolonged journey in a motor-lorry. In such cases I have usually applied the "cellophane" for 48 hours to avoid the trauma and distress of frequent dressings in an already exhausted patient. If on inspection there is a collection of pus in any one part, the overlying dressing is cut away and saline compresses are applied. The "cellophane" in the uncontaminated areas is left undisturbed and is in no way harmed or made soggy. Usually after 24 or 48 hours these infected areas are clean enough for the "cellophane" to be reapplied, and healing then occurs uneventfully.

Preparation of the Dressings

The "cellophane" sheets may be medicated, sterilized, and stored for immediate use when needed, or the unguentum

sulphanilamidi (sulphathiazole has not been available to me) may be spread on the sterile sheets of "cellophane" just before their application. All types of transparent wood-pulp tissue have been used, and have all been salvage. The paper is sterilized by first dusting with talc and then autoclaving for 20 minutes at 15 lb. The talc is then dusted off and the "cellophane" is placed flat on a sterile towel and a thin layer of unguentum sulphanilamidi 10% is spread on. It is then folded four times, with the non-medicated surface to the outside. Several such pieces are sealed in a conveniently sized tin and are always available for immediate use.

First-aid Measure

It is suggested that the application of a powdered sulphonamide to the burn or wound, followed by the immediate application of "cellophane" sterilized by boiling, offers many advantages. It permits of easy and painless inspection of the burn when the patient reaches the centre and the ultimate treatment has to be decided, and does not in any way prejudice the form of treatment to be adopted. It would prevent contamination and be bacteriostatic to infection already present in the burn. A dressing of this type is available almost anywhere.

An even more simple measure which could be applied in very forward areas when no medical equipment is available should be considered. In such circumstances the "cellophane" wrapping of a cigarette package could be applied to the burn, for its inner surface is almost certainly sterile; such a dressing would be comfortable and adequate until the patient was able to receive further treatment.

The satisfactory results achieved in this series were, as stated, all in second-degree burns. In third-degree burns, as always, treatment should be directed to preparing the burned area for skin-grafting, and the dressing would be of temporary value only.

This paper is published with the kind permission of my officer commanding, Col. David Bell, O.B.E., E.A.A.M.C.

REFERENCES

- Allen, H. S., and Koch, S. L. (1942). *Surg. Gynec. Obstet.*, **74**, 914.
Bisgard, J., Dewey, and Baker, Charles P. (1942). *Ibid.*, **74**, 20.
Davidson, E. C. (1925). *Ibid.*, **41**, 202.
Ellis, M. (1943). *British Medical Journal*, **1**, 697.
Poth, E. J. (1942). *Surg. Gynec. Obstet.*, **75**, 779.
Siler, V. E. (1942). *Ibid.*, **75**, 161.

SYMPTOMLESS ENLARGEMENT OF THE OESOPHAGUS

BY

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Many cases of enlargement of the oesophagus are on record, but these have all been associated with symptoms which led directly to the investigation of the oesophagus. The condition occurs over a wide range of age groups, and is believed to be secondary to achalasia of the cardia or to organic obstruction of the lower end of the oesophagus. In the case now to be described there were no symptoms, and the condition was discovered as a result of the usual routine examination of the chest.

Case History

A commercial traveller aged 57 was admitted to hospital on Aug. 29, 1941, complaining of pain in the joints; a diagnosis of rheumatoid arthritis was made. He did not complain of gastro-intestinal symptoms and had never had dysphagia, unexplained vomiting, regurgitation of food, or pain behind the xiphoid. There were no respiratory symptoms and he had not lost weight.

On examination of the chest the only abnormality found anteriorly was slightly increased vocal resonance in the right midzone. Posteriorly, abnormal signs were confined to the right base, where vocal fremitus was lessened, the percussion note impaired, breath sounds vesicular but diminished in intensity, and vocal resonance reduced. Movements of both sides of the chest were equal and there was no evidence of displacement of the mediastinum. The blood pressure was 118/68.