The third chief method is by injection of oil direct into the trachea through the crico-thyroid membrane, and this is the most reliable method because there is neither the difficulty of the first method in getting past the glottis nor the risk of the second method of injecting it into the oesophagus. It is possible to fill all main bronchial divisions by alterations of posture. For the insertion of the trocar and cannula (preferably the Chandler pattern) the patient lies on his back and a few minims of novocain are injected subcutaneously in the midline between the upper margin of the cricoid and the lower margin of the thyroid cartilage. The trocar and cannula are then pressed firmly through the membrane, the trocar withdrawn, the patient sat upright, and the oil injected, making sure by preliminary withdrawal of bubbles of air that the cannula is within the trachea. This method is simple, reliable, and without discomfort to the patient.

Previously it has been considered necessary to inject 5 or 10 per cent. cocaine solution through the crico-thyroid membrane before inserting the trocar and cannula, and, as in the previous methods, this may produce unpleasant symptoms, with faintness and very rapid pulse. Alternatively, preliminary tests for sensitivity to cocaine are necessary, a record of the patient's reactions and pulse rate for half an hour after the subcutaneous injection of 0.1 c.cm. being required. After cocaine has been used in the throat the patient must be instructed not to attempt to swallow food or drink for two hours, for fear of this passing into the insensitive larynx. Moreover, the sudden injection of the cocaine solution itself frequently initiates a temporary fit of coughing. Maxwell (1938) remarks that "the needle must be withdrawn immediately, as there is always a reflex cough and it is possible that the needle might be broken."

Anaesthetization of the Trachea

Is anaesthetization of the trachea necessary? Ever since Sir James Mackenzie's (1909) statement that the respiratory tract below the larynx seemed to be incapable of originating the stimulus for cough production varying views have been expressed. Larsell and Burgett (1924) have shown that in the course of bronchoscopy mechanical stimulation of the lower respiratory passages, including the carina and bronchi as far as those of the second order at least, elicits a marked cough, but Chevalier Jackson (1922) has noticed that in a large number of broncho-pulmonary diseases the cough reflex from contact with the bronchoscope seems rather diminished than increased. It is notorious that the inhalation of a foreign body is likely to set up a violent paroxysm of coughing as the foreign body enters the larynx and passes through the glottis, but once it is beyond this "laryngeal sentinel" it soon ceases to cause any coughing unless it is very movable.

Such considerations throw doubt on the necessity or desirability of injecting cocaine into the trachea when introducing oil by the crico-thyroid route. In the last fifteen instances where I have introduced oil by that route I have therefore deliberately used no cocaine. The only local anaesthetic employed was the small amount of subcutaneous novocain, and this did not penetrate the crico-thyroid membrane. In none of these cases did the patient complain of pain or discomfort and in none of them did the introduction of the oil (neo-hydriol) set up either irritation or coughing. One patient who had an irritative cough at the start took oil without effect on her coughing and was subsequently given cocaine, which quieted her.

Conclusions

It would thus appear that in many respects the crico-thyroid route without cocaine is the simplest, the most certain, and the speediest. It is undoubtedly much the most comfortable for the patient. Only a small needle-puncture wound is produced; this is covered for a day or so with a wisp of wool and a narrow piece of elastoplast not more than one inch long.

The advantages of using no cocaine are: (1) there is no necessity for previously testing the susceptibility of the patient to cocaine; (2) there is no risk of faintness and rapidity of pulse such as not infrequently occur in those who show no marked reaction to the subcutaneous test dose; (3) the patient can eat and drink immediately afterwards; (4) there is no coughing or risk of a broken needle; (5) it is a quick and simple method for out-patients.

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INSULIN AS A DRESSING FOR CHRONIC INDOLENT ULCERS

BY

A. R. HUNTER, M.B., Ch.B.

Resident Medical Officer, Falkirk and District Royal Infirmary

The use of insulin as an external dressing is by no means to be regarded as an innovation; Lawrence has mentioned its employment in 1926 by certain French workers. Fresh interest in the subject has, however, recently been aroused by the writings of Leyton (1938), who states that epithelialization of chronic skin wounds proceeds very rapidly when insulin is used as a dressing. With a view to the confirmation or otherwise of this statement it was considered desirable in the present investigation to secure a more accurately controlled series of cases.

The Present Investigation

With the help of Messrs. Burroughs Wellcome's technical and scientific department two solutions were prepared, the first being a solution of insulin of strength 40 units per c.cm., and the second a control solution containing the same percentage of tricesol, of the same pH and osmotic value. Wherever possible two similar wounds in the same patient were dressed in the same way. If that was not feasible the control solution was applied first. Thereafter an application of the insulin proper was made. In every case the solutions were used in the form of a "wet" dressing; for it is unlikely that the concentration could be maintained in the ulcer area if the insulin were allowed to soak into the covering layers of gauze and bandage. Details of the cases studied are as follows.

Case 1.—A typical callous varicose ulcer in a neglectful patient. Fourteen days' dressing with the control solution produced satisfactory granulation and healing. Soon, however, this dressing ceased to be an effective stimulant of epithelial growth. Fourteen days' further treatment with insulin did not alter the now slowed rate of healing, but at a later date a change to Hey's wash (lotio rubra) produced satisfactory and complete closure.

Case 2.—A varicose ulcer, about three inches in diameter, over the anterior aspect of the tibia, with a yellowish sloughy

base and no evidence of vital reaction, in a woman aged 78. Application of the control solution resulted in immediate discharge of much pus, clearance of slough, and some signs of epithelial regeneration. Insulin dressing produced a similar effect but no increase in the rate of epithelization.

Case 3.—A plaster sore in a patient aged 13 transferred from a distant hospital in a hip plaster. This was dressed for one week with control solution and for one week with insulin. No difference in the rate of epithelization was noted. The slough separated speedily with the control solution.

Case 4.—A callous ulcer in a burn scar in the axilla of a child aged 4. Control solution was applied, with satisfactory granulation and epithelization. Four weeks later epithelization slowed down to a marked degree, although granulations required the application of bluestone. At this stage insulin failed to produce epithelial reaction.

Case 5.—Avulsion of most of the tissues round the knee-joint with scarring and callous ulcer formation—the late result of a road accident to a boy aged 11. There were two pairs of similar areas on this leg. One of each of these pairs of areas was dressed with insulin and the other with the control solution. Over a period of three weeks healing was unsatisfactory with both dressings. A change was then made to Hey's wash, and epithelization started satisfactorily.

Case 6.—Cellulitis of dorsum of foot, leaving a wide raw area, in a patient aged 74. The region was dressed for ten days with the control solution and for ten days with insulin. Healing was satisfactory with both dressings. As at one period it appeared that the whole foot would become gangrenous it is surprising that healing occurred at all. Exuberant granulation was not observed in this case.

Case 7.—Burn of dorsum of foot caused by molten metal. Here there were two areas of epithelial loss. One was dressed with control solution and one with insulin. In both healing was satisfactory and proceeded at the same rate.

Case 8.—This refers to the same patient as Case 7, but at a date two months later, when scarring and neglect had led to loss of epithelium and the development of overhanging edges and a sloughy lifeless base. Both insulin and control solutions were tried and both failed. No other dressing used hitherto has proved satisfactory.

Case 9.—Chronic ulcer of the thoracic wall following the application of deep x rays to an area from which a breast cancer had been radically removed. At this period insulin only was available, and a control was provided by a similar case treated with saline dressings. At the beginning of treatment the skin edges were rolled and the base of the ulcer was purely slough, but after about three weeks some evidence of a healing epithelial edge was seen. The patient defaulted long before healing was complete. The control case showed healing at much the same rate, but was not entirely satisfactory as a control since this patient was the more robust of the two.

Case 10.—Callous ulcer of the buttock following a carbuncle which discharged its slough and failed to heal. The patient was a diabetic. Control solution produced in forty-eight hours the signs of extending ulceration, the skin edges becoming ragged and the surrounding tissues inflamed. After a few days' boric acid dressing, which restored the ulcer to its original callous condition, insulin was tried, but its effect was similar to that of the control solution.

In chronic cutaneous sepsis the epithelial cells are deprived by the subjacent fibrosis and endarteritis of their normal supplies from the blood stream. In the absence of these supplies it seems reasonable to assume that the epidermal cells will develop a preponderantly glycolytic metabolism such as Warburg (1930) has described in tumours, and with this metabolism lose the power of regular growth. The theoretical basis for the use of insulin in such cases is that this substance might be expected to stimulate aerobic metabolism and thereby restore growth to its previous regularity.

Conclusions

In practice, however, the following conclusions were reached:

There is no serious evidence of any injurious local effect from the use of insulin as a dressing agent. (Case 10 is exceptional in that the patient died two days after the test from chronic pyaemia which had lasted almost three months.)

In nearly all cases some progress of the wound towards healing occurred.

With two of the patients (Cases 1 and 4), when the control solution had ceased to stimulate epithelial growth the use of insulin produced no further reaction such as would be expected from a change of dressing.

Where an ulcer had a sloughy base one of the first reactions was a profuse purulent discharge with both dressings.

There was never any evidence of systemic absorption of insulin—that is, no hypoglycaemic symptoms were observed—and accordingly it was not considered necessary to investigate blood-sugar levels.

In general it may be concluded that insulin is no more satisfactory as an external dressing than a similar solution of tricresol containing no insulin.

I have to acknowledge with thanks the supply by Messrs. Burroughs Wellcome of a solution of insulin and a control solution for use in this clinical experiment.

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Clinical Memoranda

Mumps as a Possible Complication of Chronic Pancreatitis

Acute pancreatitis is a recognized complication of "mumps," but I have been unable to trace a recorded case of "mumps" occurring after pancreatitis. The following case history is therefore of some interest.

CASE RECORD

A woman aged 77 was admitted to hospital on October 14, 1938, after three weeks' illness. She had had a "cold," followed in one week's time by sharp intermittent pain below the right scapula and in the right hypochondrium. The skin had become progressively more jaundiced, the stools were clay-coloured, and there was nausea but no vomiting. No loss of weight was admitted, and she had never had jaundice previously.

On admission moderate jaundice of skin and conjunctivae was present, but there was no elevation of temperature and the pulse rate was 90. The gall-bladder was distended and easily palpable almost down to the level of the umbilicus, and the liver was palpable an inch below the costal margin. The stools were clay-coloured and the urine contained bile. Clinically, carcinoma of the head of the pancreas was the diagnosis. While in hospital the jaundice became progressively deeper and the gall-bladder bigger. Radiographs showed no stones. The temperature became slightly raised in the