

experiments (Table III) it has been shown that the effect of both substances is complementary.

Summary

Atropine administered locally in cigarette smoke or wet aerosols increases the vital capacity and gives a feeling of relief in cases of mild or moderate chronic asthma and emphysema.

The effective dose probably lies below 0.4 mg. of atropine sulphate.

Atropine is easily administered by smoking. This method of administration is simple; as the dosage can be accurately controlled, it is preferable to that of wet aerosols and of stramonium cigarettes.

I am indebted to Dr. B. Holmstedt, Stockholm, and Dr. Andrew Herxheimer, London, for their advice, and to the Vitrum Company, Stockholm, 12, which supplied the atropine cigarettes. Messrs. E. Merck & Co., Darmstadt, kindly supplied methylephedrine in tablets and solution.

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The Nutrition Research Laboratories of the Indian Council of Medical Research have just issued their annual report for 1957-8. Studies on proteins and protein malnutrition, iron metabolism, and vitamins are included. There are sections devoted to field investigations in some Nilgiri tribes; studies in human lactation; and the growth and physical development of Indian children. A brief account is given of the education and advisory work done by the Laboratories (*Annual Report for 1957-8*, Nutrition Research Laboratories, India Council of Medical Research).

TREATMENT OF PILONIDAL SINUS BY EXCISION AND PRIMARY CLOSURE*

BY

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In the past seven years the cure of 442 cases of pilonidal sinus has been undertaken in the United Birmingham Hospitals, a teaching group where it is to be expected that a complete spectrum of cases and operations is to be seen besides operations of a highly specialized nature requiring team-work.

Except in those instances where the patient presents with an acute abscess for incision and drainage, the track and ramifications of the sinus must be excised. There are two opposing views on what should be done with the wound after this: should it be left open to be allowed to granulate from the bottom or be closed by primary suture? Textbook and practice have often given the impression that the former method is the one of choice on the grounds that the sinus is chronically infected, that the whole area is a "dirty" one, and that the frequent multiplicity of sinus openings prevents the surgeon from obtaining and retaining primary closure of the wound. A random sample of the records of 72 cases treated in one of the two teaching hospitals here shows that 33 wounds were allowed to granulate and 39 were closed by primary suture (46.5% : 53.5%).

If the wound is allowed to granulate, the patient must be resigned to a longer stay in hospital, time in a

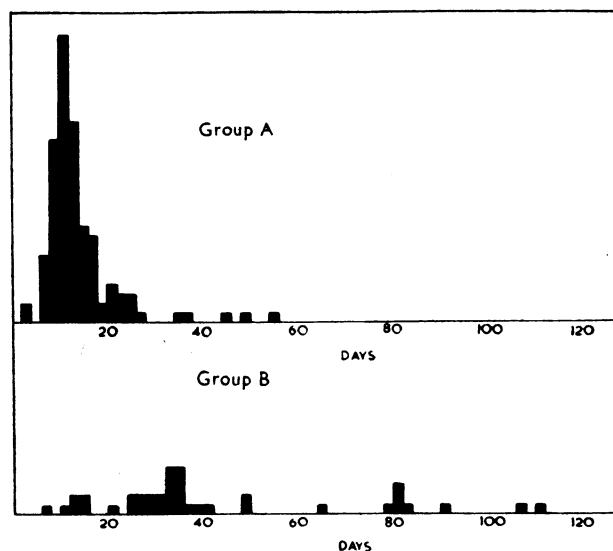


FIG. 1.—Number of days spent in hospital by patients. The majority of group A cases (after excision and primary suture) are sent home with wounds healed. The early discharges in group B patients are sent out of hospital with open wounds, which are dressed in a convalescent hospital or at home by a district nurse.

convalescent hospital, and an extended period off work, with daily dressings carried out by a district nurse. The open wound is unpleasant, the scar is liable to excoriation, and recurrence, for which the pilonidal sinus is notorious, is still possible. Of the 33 cases mentioned above, four recurred. Of the 39 cases of excision and closure, three recurred.

When careful attention is paid to technique, success from primary suture may nearly always be achieved

*Read to the Section of Surgery at the Annual Meeting of the British Medical Association, Birmingham, 1958.

and the patient is able to return home and to work in the minimum time with a clean and comfortable wound.

It so happened that the group of surgeons working together in the wards of the professorial surgical unit favoured excision and closure, and of 118 patients performed it on 112 (95% : 5%). Of these 112 patients, 72 were males, and 40 were females. The length of stay in hospital until the wound was healed was in most cases 10 to 14 days, and home was the usual method of disposal. This point is shown graphically in Fig. 1, which also portrays the length of stay of 39 cases in which the wound was left open and where disposal was usually to convalescent hospital or home for daily dressings. Instances where delay or failure in healing of the sutured wounds occurred are also apparent. In seven cases there was a slight delay in healing, and in four cases the wound did not heal by first intention and fell open when the sutures were removed. Haematoma formation was the cause of this. Out of the 112 cases, there were 11 recurrences (one in a woman and 10 in men), but this rate is no higher than that already given for the "open" cases.

Operative Technique

The following are personal notes, and in detail do not apply to all the cases reported on.

Pre-operatively the patient is given clear glucose fluids on the day before operation, and where possible a low-residue diet for two days before that. An aperient and a soap enema are given, and the skin is prepared by twice-daily baths and swabbing with spirit and chlorhexidine ("hibitane") solution (0.5%). A close shave is essential, since the presence of short hairs on each side of the natal cleft encourages growth into the cleft before the wound has healed.

Under intratracheal anaesthesia the patient is put into a flexed-prone position (Fig. 2). The buttocks are held apart by plaster strips anchored to the table. The skin is prepared with chlorhexidine solution. One of the principles of the excision is not to remove any more tissue than is absolutely necessary, and to this end the injection of indigocarmine into the primary opening of the sinus is most helpful. The dye stains and outlines all the ramifications of the sinus, and, provided the surgeon keeps his excision well clear of any such stained tissue, a successful removal is achieved. Most



FIG. 2.—The flexed-prone position. The buttocks are held apart by strapping. The knees are flexed by resting the lower legs on a pillow strapped to the operating table. The diathermy electrode is shown wrapped round one leg.

commonly, the elliptical incision which is used lies in the long axis of the body, but if the secondary openings are displaced to one side it is better to use a curved "boomerang" incision so that a flap is formed which can easily be rotated round to afford complete closure without tension (Fig. 3). The size and thickness of this flap depends upon the volume of tissue affected, and in the extreme case a musculo-fascial flap is made.

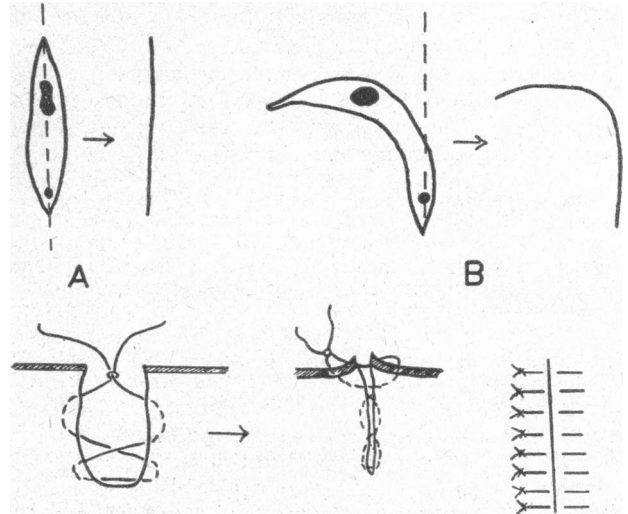


FIG. 3.—An elliptical incision (A) in the long axis of the body is usual. A curved boomerang rotation flap incision (B) is needed when secondary openings are sited well away from the midline. The placing of the buried figure-of-8 catgut suture whereby the deep fascial layers are united and tension on the skin edges is avoided. Interrupted vertical mattress sutures achieve neat eversion of the skin edges.

Haemostasis is secured with diathermy or with fine plain catgut, and the subcutaneous and deep fascial layers are mobilized to permit suture. I do not favour deep tension sutures, and all strain on the wound is taken up by a row of buried figure-of-eight catgut sutures (Fig. 3), taking care that the deep fascial layer is included. All these sutures are placed in position but not tied until the plaster strips holding the buttocks apart are cut. In this way the wound comes together so that vertical mattress sutures may be placed in the skin to cause eversion of the wound edges without any tension. Dressings are not sewn on, for such a method causes discomfort to the patient and constant movement of a wound which should be left at rest. Instead, the wound is sprayed with "nobecutane," and this is allowed to dry before a gauze dressing is applied with supporting wool and strapping. The wound is sealed from the anus by the careful application of waterproof strapping: this is important, because some sinuses encroach on the anal canal.

The patient is nursed in the prone position, but is got up after two days, being encouraged to stand rather than sit unless it be on a "commode" type of seat. Theatre dressings are untouched as long as possible (five to seven days), and then, depending on its condition, the wound is cleaned with ether and powdered with thymol iodide ("aristol") twice daily or dressed with a spirit roll. It may be necessary to cut any short hairs that are regrowing close to the edges of the incision.

A low-residue diet is continued for five days. Enemata are given on alternate days after this. Baths are given after seven days. Alternate sutures are removed on the eighth day, the remainder being left until the tenth or twelfth day.

Summary

Most cases of pilonidal sinus can be treated by excision and primary closure of the wound in preference to excision and allowing the wound to granulate—a method still commonly taught and practised. With primary closure the recovery time is shortened, and the risk of recurrence is no greater than that following the other method. The experience of primary closure in 112 cases is recorded and a technique is described.

My grateful thanks are due to Sister M. Simpson for the development of the nursing regime described above.

SENSITIVITY TO PHENINDIONE**REPORT OF A CASE OF SEVERE DIARRHOEA**

BY

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The cases of severe sensitivity to phenindione described in the literature were found by Burns and Desmond (1958) to be manifested by pyrexia and blood dyscrasia, less commonly by a rash, and in two cases by jaundice. Apparently no case of severe diarrhoea produced by phenindione ("dindevan") has been described.

Case Report

The patient, a 67-year-old retired consultant physician, had always enjoyed perfect health up till 1951, and, in particular, had an uneventful gastro-intestinal history apart from appendectomy at the age of 28. He had had his bowels open twice a day for as long as he could remember, and the motions had always been normal.

In 1951 he had a small posterior myocardial infarction. He was initially treated with bed rest only, but when in the fourth week a phlebitis in the right leg was followed by a massive pulmonary infarct of the right lung, ethyl biscoumacetate ("tromexan") was used as an anticoagulant. The anticoagulant therapy was continued for three months. During this illness he was troubled by severe constipation, which required several enemata a day for relief. In 1954 he was found to have a popliteal aneurysm in the right leg, for which a lumbar sympathectomy was performed. For some weeks after the operation he was again treated with ethyl biscoumacetate, which produced no certain side-effects.

Since that time, up till November, 1958, he was able to lead an active professional life. He had occasional intermittent claudication in the right leg, which became more and more troublesome during the course of 1958. His bowels had, if anything, been slightly constipated and he occasionally used a little "agarol."

Early in November, 1958, whilst gardening, he injured the big toe of his right foot; this was followed by spreading superficial venous thrombosis. At this stage it was obvious that the aneurysm of the right popliteal artery had thrombosed and that the arterial blood supply to the right foot was extremely precarious. It was also discovered that there now was an aneurysm of the left popliteal artery. He was admitted for observation to the Radcliffe Infirmary under the care of Professor P. R. Allison and Professor Sir George Pickering.

Anticoagulants were started on November 9. This time phenindione was used. Conservative treatment made little difference to the condition of the leg, and an above-knee amputation was undertaken on November 26. Before and during the immediate post-operative period, large doses of analgesics (heroin and pethidine) and of hypnotics (barbiturates) were required to allay pain and ensure sleep. If anything, he was constipated. Throughout he had been

on phenindione, and the one-stage (Quick) "prothrombin time" was kept within a range of 10–20%. From about December 20—that is, about six weeks after phenindione was first used—he noticed that his stools were getting soft and bitty. He put this down to the large quantities of fruit he had been eating during his convalescence. The healing of the stump proceeded uneventfully. In view of his history and the left popliteal aneurysm, it was decided to keep him on anticoagulants for an indefinite period. He was discharged from hospital on January 9, 1959.

Shortly after his return home he developed frank diarrhoea. He initially had four to five actions a day, but the condition steadily deteriorated, and by January 25 he had developed a frank steatorrhoea, with watery white stools. At that stage he was only having barbiturate ("tuinal") at night and phenindione in a dose sufficient to keep the prothrombin level within the therapeutic range (10–20%). The dose of phenindione varied, but was usually of the order of 50 mg. a day. Codeine phosphate, a kaolin and morphine mixture, and a low-fat diet made no difference to the condition. Phenindione seemed to be the only drug that could be responsible for the diarrhoea, and he was switched to ethyl biscoumacetate, which he had previously tolerated. Dr. John Badenoch saw the patient and agreed that clinically he appeared to have steatorrhoea.

A barium enema examination showed a few diverticula of the sigmoid colon only, and a barium-meal and follow-through examination revealed no abnormality other than intestinal hurry. Hb was 105%, W.B.C. 10,500; the film showed a neutrophil leucocytosis, and the E.S.R. was 8 mm./hour. Plasma proteins were 6.9 g. per 100 ml. (albumin 3.7 g.). Flocculation tests were negative. Bilirubin was 0.4 mg. per 100 ml. There were traces of occult blood in the stools, but no pathogens were isolated. A 24-hour stool specimen obtained on January 28 contained 39.5 g. of fat and 3.5 g. of nitrogen. The patient was put on a convalescent sprue diet and given folic acid, "multivite," vitamins A and D, calcium gluconate, and vitamin B₁₂. Before this treatment was started—that is, three to four days after he was switched from phenindione to ethyl biscoumacetate—his general condition improved, and within a week his stools became normal, with a return of his former bowel habits. On February 1 a 24-hour specimen of stool showed a content of only 10.8 g. of fat and 1 g. of nitrogen.

Although phenindione was thus suspect, it was thought unlikely that it had been responsible for the diarrhoea, and for convenience the patient was again switched to phenindione on February 11. He continued on a convalescent sprue diet with vitamin supplements as outlined above. On February 12 his motions became loose, and by the 16th they had become very loose and fluid. He had his bowels open six or seven times in the course of the day and night. The motions were now more like dysentery stools, watery, with blood and mucus. Codeine phosphate made little difference. The stools again yielded no pathogens. The blood electrolytes remained normal, and the blood picture was normal. On February 16 it was decided to discontinue all medication except the anticoagulant therapy and to revert to ethyl biscoumacetate. In spite of the exhausting diarrhoea, the patient felt hungry; he found his sprue diet quite insufficient, and was allowed a normal diet, avoiding excess fat. Within a week his stools again improved. The motions became normal and he was eating with normal appetite, and was apparently perfectly well by February 26. He has since been on ethyl biscoumacetate, which has presented no problems.

Discussion

In this patient the onset of diarrhoea occurred about six weeks after phenindione therapy had been started. By about the eleventh week he developed a frank steatorrhoea. When the phenindione was discontinued and ethyl biscoumacetate substituted, the condition improved after four to five days. At first he