last year or so. It has been established that the risks are not great, and that the results are good in many procedures.

The assessment and selection of patients for surgery involve special investigations and are the outcome of co-operation between the cardiologist and surgeon.

Any approach to the interior of the heart has to be considered in relation to the control of bleeding. The appendices of the auricles constitute a ready means of access and control which is not available in the ventricles.

Hypothermia and extracorporeal circulation methods undoubtedly will enlarge the scope of "direct vision" intracardiac operations, but they are not yet sufficiently developed for routine application.

Individual operations are discussed with indications regarding the operative risks and results. Mitral valvotomy has proved to be a most satisfactory procedure, as also has pulmonary valvotomy in certain cases. Aortic valvotomy is less satisfactory. Operations for mitral and aortic regurgitation cannot be regarded as satisfactory. Steady development in methods of closure of septal defects gives considerable promise.

MAMMILLARY FISTULA

BY

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Mammillary fistula is a term proposed for a relatively common inflammatory lesion of the breast that has received very little attention. The condition presents as a chronically discharging lesion in the region of the areola involving one or both breasts. Sometimes there is a long history of the gathering of a subcutaneous abscess which discharges spontaneously with apparent resolution, only to recur again and again; in other cases the patient has undergone a series of operations for incision of the abscess with relentless recurrence, so that relief is finally sought by mastectomy. It is not commonly appreciated that these discharging lesions are in fact fistulae into lactiferous ducts. They behave in a fashion similar to that of fistula in ano, and their treatment is almost identical.

Aetiology

The aetiology of the lesion is that a lactiferous duct becomes blocked. The insensible discharge from its orifice, which is normally of such a trivial degree that it dries into a scarcely discernible crust and is brushed away by the clothes, is unable to escape; it accumulates behind the block and becomes infected. Occasionally the products of inflammation will force themselves through the obstruction and discharge spontaneously at the nipple; more commonly they will burst or be opened on to the surface, forming what is apparently a sinus but is in reality a fistula. This being the case, simple incision of these lesions will relieve the condition temporarily, but when the surface heals fresh secretion accumulates, becomes infected, and forms another abscess, and so the cycle is repeated.

The causes of the obstruction to the lactiferous ducts are various. In many cases the condition is associated with congenitally retracted nipples, a disposition which renders the natural escape of secretion difficult; in some the condition arises in relation to pregnancy or early lactation, when the products of epithelial desquamation are particularly apt to occlude the ducts; in others no discernible cause can be found, and in one case in the series reported below the obstruction was caused by a duct carcinoma.

Treatment

The treatment of these conditions, and one which will almost certainly effect a cure, as is possible with no other method apart from the unnecessary performance of a mastectomy, is to deal with them in a manner similar to that which has been found so successful in the case of fistula in ano.

The sinus is explored with a fine probe, and this will be found to pass readily towards the nipple. A little gentle manipulation causes the probe to protrude through one of the lactiferous ducts at the nipple (Fig. 1). An incision is then made on to the probe so that this is released (Fig. 2), and the edges of the wound so caused are cut away and the area is saucerized to form a smooth shallow cavity (Fig. 3), which is packed loosely with gauze soaked in eusol. At first dressings are done at four-hourly intervals during the day. At night, when there is likely to be an interval of seven hours or more between dressings, these are covered with some waterproof material to prevent the dressing adhering to the

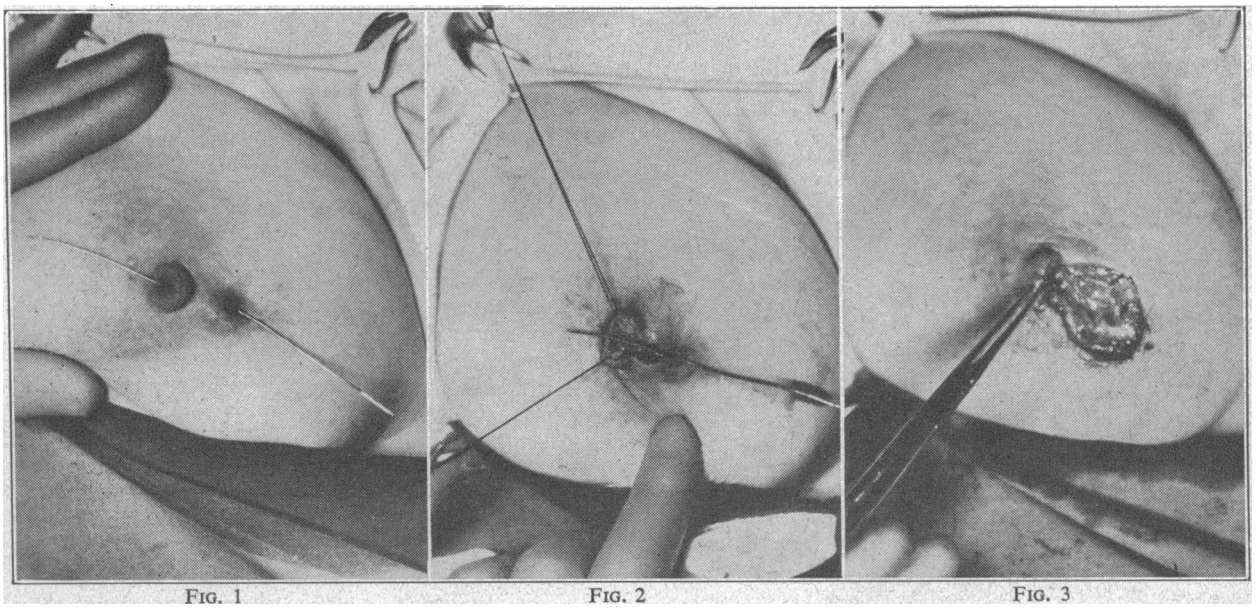

FIG. 1 FIG. 2 FIG. 3

FIG. 1.—A fine probe has been passed through the length of the fistula, emerging at the nipple. FIG. 2.—An incision has been made on to the probe, liberating it. FIG. 3.—The resulting wound has been saucerized.

sensitive granulation tissue. Dressings are so arranged and the timely use of the silver nitrate stick is so regulated that the shallow saucerized cavity heals up slowly and steadily from the bottom (Fig. 4). As time goes on, dressings will be required less frequently, but the patient will probably have to remain in hospital for three weeks, and for three weeks thereafter be visited by the district nurse for daily dressings. The wound generally heals completely in six weeks with the formation of a scar that is far less unsightly than might be anticipated, and recurrence is exceptional (Fig. 5).

Credit for recognizing the true nature of these lesions belongs to Zuska, Crile, and Ayres (1951), who appreciated the fistulous nature of the condition and were the first to

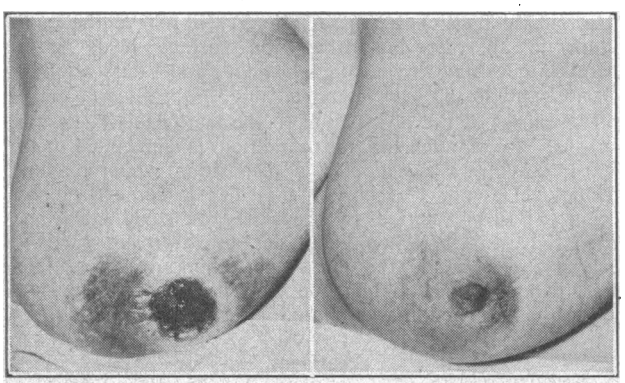

FIG. 4 FIG. 5

FIG. 4.—Healing is taking place by granulation. FIG. 5.—The resulting scar four weeks later.

liken it to fistula in ano. They failed to recognize, however, the common association of this lesion with previously indrawn nipples, which was apparently not a noticeable feature of the five cases they describe. Kilgore and Fleming (1952) reported on 64 patients with subareolar abscess; they remark on the tendency for these abscesses to recur, and observe that carcinoma was not associated with the condition in any of their cases. These authors find, as might be expected, that antibiotic therapy is of no avail. After a trial of many methods they finally conclude that the proper method of treatment is on the principles described above.

Present Series

Since the last war I have treated 28 of these cases, and features of the series are noted in the Table. This Table requires little amplification. In one case, in addition to the 19 quoted as having inverted nipples prior to the infection, the nipple which had previously been normally protruded became inverted subsequent to the onset of infection. The age of the patient on whom biopsy of the track showed duct

Features of Present Series

Total number of cases (all female)	28
Married	25
Bilateral affection	7
Nipples previously inverted on the side or sides of lesion	19
Associated with late months of pregnancy or lactation	7
" " malignancy	1
Average age	34 years
Age range	21–63 "

carcinoma was 47, and a radical mastectomy was at once performed on this side. In two of the cases the infection was associated with pregnancy and a fresh abscess occurred with each subsequent pregnancy—on one case three times, and in the other four times.

In the early years these cases presented a troublesome therapeutic problem. Following the customary practice, we would incise the septic collections as they appeared, and the inevitable recurrence was a source of grave aggravation to the patient and of anxiety to us. Multiple operations and repeated courses of injections with antibiotics were the rule. One case with bilateral fistulae had had over twenty operations for drainage of these abscesses before attending the breast clinic, and bilateral mastectomy had been recommended by two surgeons. This lady, aged 23, had recently married, and the prospect of losing both her breasts drove her to seek further advice. Fortunately she arrived on the scene at a time when the nature of this condition had begun to be appreciated, and adequate saucerization led to complete healing.

Since adopting the procedure described above we have had no recurrence in this series to date, but in view of the possible association of this disorder with carcinoma a biopsy of the track should always be performed.

Summary

The term mammillary fistula is suggested for a common inflammatory disease of the breast which has been almost unrecognized. The treatment for this condition, on the lines of that practised for fistula in ano, is described, and a note on 28 cases illustrates the main features of the syndrome.

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DIAGNOSIS AND TREATMENT OF MYELOPATHY DUE TO CERVICAL SPONDYLOSIS*

BY

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This paper provides a review of 39 patients with cervical spondylosis that have been treated by operation, in all of which the neurological manifestations clearly indicated that the cervical spinal cord had become damaged. A wider review of the subject, including a comparison of the results of conservative and operative treatment, has already been published (Brain, Northfield, and Wilkinson, 1952). Treatment of the spondylosis itself is beyond the scope of this paper; indeed, if the spondylosis is painless the spinal condition passes unrecognized until neurological disturbances become manifest. These can be crippling in their effect. Whether the prevention of myelopathy in a person known to have spondylosis can be achieved by simple means is a subject to which little attention has yet been paid. The *Lancet* (1955) states: "It behoves us as we grow older to adopt a more regal posture and bearing, and to avoid all rapid, undignified movements of the head and neck."

Radiology of the neck reveals that spondylosis is a common enough condition from middle age onwards, but we do not know the factors which determine the development of myelopathy in one patient and not in another (though they may apparently have the same degree of spondylosis), nor why the rate of evolution of symptoms varies so widely. In the cases under review the shortest duration of symptoms was six weeks, and the longest twenty years. Delay in seeking medical help and delay in arriving at a correct diagnosis do not fully account for this. Natural variations in the diameters of spinal canals may make some spinal cords more vulnerable than others. The speed of growth of osteophytes and the question whether one or more disks

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