Thus, far from there being a vacuum in primary care, the field is hotly contested. But, while the internists continue to fight for a piece of the action, not everybody is happy about a drift which encourages ambitious trainees to take subspecialty boards and which deals a death-blow to the older concept of the general internist as a consultant. This point of view has been espoused by Dr. John Moyer, who believes that present trends are doing to the general internist what internal medicine did to the general practitioner in the past, leaving the internist with what is left over after all the subspecialists have scooped up the "cream of the crop."

Perhaps then there will be weeping at the demise not of the kindly old G.P. but of the general consulting physician as he

was understood in the days before the fragmentation of medicine. One might recall that in 1885 Samuel Wilkes warned that "since medical specialism has no basis in nature, it therefore cannot be attempted without detriment to the patient."¹ Yet 90 years later the head and belly doctors are firmly established at the apex of the pyramid, and their respective teams of fellows and research associates stand poised to work-up completely and separately the referred patient with abdominal migraine.

Reference

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Hospital Topics

Closure of Abdominal Wounds by Adhesive Strips: A Clinical Trial

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Summary

In a randomized trial of wound closure in 512 abdominal wounds, wounds were closed with either reinforced Steristrip skin closures or interrupted silk sutures. Comparisons were made of wound pain and discomfort, wound infection, discharge, redness, width, and skin reaction. The causes of peeling of the tapes were assessed. The results showed that tapes were significantly more comfortable and that patients preferred them to sutures ($P < 0.01$), but wide scars occurred more often. There was no difference in rates of wound infection and no case of allergy to the tapes was seen. Closure of abdominal wounds by these tapes is a satisfactory procedure that could be used more extensively.

Introduction

The concept of using surface adhesive tape to close surgical wounds is not new and antedates the development of a satisfactory suturing technique. Linen strips were used in Egypt in 1600 B.C.¹ Ambrose Pare² and John Hunter³ both described techniques of sutureless skin closure, but sutures have been the usual method of wound closure since the advent of aseptic surgery enabled a safe and reliable method of suturing wounds to be carried out.⁴ Sporadic attempts to reintroduce adhesive tape have failed because of the difficulties of producing a material that could be sterilized while retaining its adherent properties.

Golden⁵ described the use of a sterilizable tape which caused no chemical irritation, could be removed painlessly, permitted free evaporation of fluids, and was easy to handle while wearing surgical gloves. This Steristrip skin closure has now been modified and has twice the adhesion to skin and three times the tensile strength of the original tape. There are many reports of the satisfactory use of such tapes in series of up to 500 patients but there are no reports of a randomized clinical trial. This paper reports our experience in such a trial of 512 abdominal incisions.

Patients and Methods

All patients over the age of 20 years undergoing elective abdominal surgery were eligible for inclusion in the trial. Patients undergoing emergency surgery and some having stoma construction were excluded. Patients who died or in whom the wound was reopened were excluded from analysis. Altogether 512 wounds were available for study.

The deep layers of the wound, including peritoneum and muscle sheaths, were closed with monofilament nylon. Near and far sutures and continuous monofilament nylon were used in all vertical incisions. Closure of subcutaneous fat by catgut sutures was optional but not widely used. In obese patients (abdominal wall fat > 2 cm) interrupted silk sutures, at least 3 in (7.6 cm) apart, were permitted in taped closures. The skin was closed by either sutures or tapes, determined by drawing a card in the operating theatre while the deep layers were closed.

The tapes used were $\frac{1}{2}$ in $\times$ 4 in (1.3 cm $\times$ 10.2 cm) reinforced Steristrips (R 154, 3 M U.K.). They were applied as follows: the skin was cleaned and dried, and skin hooks were applied to each end of the wound and held so that the incised edges lay together. A tape was laid on the skin on the side away from the surgeon and traction applied until accurate alignment was obtained, and the tape was then laid across the wound. Further tapes were then laid in place leaving $\frac{1}{8}$ -in (3.2-mm) gaps between tapes. Obliquely lying tapes were then added as necessary. The incision and the tapes were covered by a Microdon dressing.

In the postoperative phase the wound could be examined by removing the Microdon dressing. This was done by dividing the Microdon dressing along its non-adherent central portion parallel to the incision and peeling each half away from the wound: Steristrips were removed

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by peeling towards the incision from each side and then gently lifting them away.

Sutured wounds were closed with 3-0 silk on an atraumatic needle usually using interrupted vertical mattress sutures. Dressings were left to the discretion of the surgeon.

Data were recorded on preprocessed punch cards. The direction and length of incision (longer or shorter than 15 cm), the depth of fat (greater or less than 2 cm), and the potential for wound infection were recorded. Operations in which a viscus had been opened were considered potentially infected. Undue difficulty in closure was also recorded.

Sutures or tapes were removed on the eighth day for transverse incisions and on the 10th day for vertical and oblique incision unless there were indications for earlier or later removal. At this time a record was made of subjective patient impressions of wound pain and discomfort and itching. Subjective assessment of peeling, scar redness and width, infection, and haematoma formation was made by one of us.

Statistical analysis was by the χ^2 test expressed as probability values from standard tables (Documenta Geigy).

Results

The results were analysed to give an overall picture and then broken down to show performance according to specific criteria. Those criteria on which both methods could be directly compared are shown in table I. Differences between the two groups in infection, haematoma formation as assessed by the need to remove sutures and tapes to let out blood or pus, skin reaction, itching, and redness of the scar did not reach statistical significance. Nevertheless, red scars were seen twice as often in the sutured group.

TABLE I—Comparison of Sutures and Tapes for 512 Patients

	Sutures	Tapes	P Value
No. of Patients	250	262	
Pain or Discomfort	27	11	<0.01
Itching	4	4	N.S.
Skin reaction	7	10	N.S.
Wide scar	4	15	<0.05
Red scar	8	4	N.S.
Infection	21	29	N.S.
Drainage difficulty	17	11	N.S.

Smaller groups were also examined but no statistical differences could be shown by analysis of the direction of incision, depth of fat, length of incision, or potential infection. Wound infection occurred more often in obese patients and those with contaminated wounds regardless of the method of skin closure (table II).

TABLE II—Infection Rates Related to Wound Contamination and Obesity. Results are Numbers Infected out of Numbers in each Category

	Sutures	Tapes
Non-contaminated	7/134 (5%)	6/132 (5%)
Contaminated	14/116 (12%)	23/130 (18%)
Patients ≤ 2 cm fat	14/139 (10%)	24/151 (16%)
Patients > 2 cm fat	7/111 (6%)	5/111 (5%)

There was no difference in skin reactions, and in both groups they were due to wound tension. Blisters may be formed by the traction of tapes on the skin and the silk suture may cut into the skin leaving ugly cross-hatching. There were no allergic reactions to the tape. Significant differences were seen in only wound pain ($P < 0.01$) and scar width ($P < 0.05$), though the total number of wide scars was very small and 94% of wounds were considered cosmetically satisfactory.

The problem of peeling is peculiar to tapes and a direct comparison was therefore not possible. Fifty (19%) taped wounds had some trouble with premature peeling, but in 26 of these it was an isolated problem readily dealt with by replacing the tapes in the ward. Peeling did not seem to be related to the length of the wound, obesity, or potential wound contamination, but there was a significant correlation with wound infection, problems with drainage, and wide scars, though these latter two also seem to be related to the increased incidence of

TABLE III—Significance of Peeling of Tapes

	No. of Patients	Fat	Thin	Wide Scar	Infection	Drainage
No. peeling	50	32	18	11	13	5
No. not peeling	212	118	93	4*	16*	6*

wound infection (table III). Twelve of the thirteen patients with wound infection had potentially infected wounds and only one had a surgically clean wound ($P < 0.01$).

Another problem not amenable to comparison between sutures and tapes is that of ease of application. Surgeons are accustomed to suturing wounds and use this as a control when assessing tape closure of wounds. Some difficulty with application of tapes was recorded on 20 occasions. This was usually due either to failure to dry the skin properly or to persistent oozing. This was a problem encountered mainly at the beginning of the trial before the surgeons were familiar with using tapes.

Analysis of smaller groups considering the direction of incision (vertical, oblique, or transverse), potential wound infection, obesity, or wound length did not show any significant differences between tape and suture wound closure, except where overall results had done so (table IV).

TABLE IV—Overall Results Analysed by Direction of Wound

	Vertical (n = 310)		Oblique (n = 138)		Transverse (n = 64)	
	Sutures (n = 147)	Tapes (n = 163)	Sutures (n = 75)	Tapes (n = 63)	Sutures (n = 28)	Tapes (n = 36)
Pain and discomfort	11	10	16	0	0	1
Itching	2	3	2	1	0	0
Skin reaction	3	9	4	1	0	0
Wide scar	3	12	1	0	0	3
Red scar	6	4	2	0	0	0
Infection	18	21	3	3	0	5
Difficulty with drainage	8	8	9	1	0	2

There were no complete wound dehiscences in the 512 wounds, of which 310 were midline or paramedian incisions, which was a reflection not of the skin closure but of the use of non-absorbable material in the deep layers of the wound.

Discussion

The rationale for the closure of wounds by tapes instead of sutures has been reviewed by Golden *et al.*⁶ The studies of Ordman and Gillman⁷ and Forrester *et al.*⁸ give an experimental and theoretical basis for expecting improvements after a change to this method of skin closure. Forrester *et al.*⁸ in their study of collagen in skin wounds showed that taped wounds had greater tensile strength than sutured wounds and that this difference was still appreciable at 150 days. They attributed this to alignment of collagen at an earlier stage in healing.

There are theoretical reasons for expecting a reduction in wound infection after taped closure⁶: the number of organisms needed to cause an infection is reduced by a factor of 10 000 in the presence of a silk suture.⁹ Moreover, survival of *Staphylococcus pyogenes* in the deep layers of the skin is greatly reduced under a micropore tape.¹⁰ We were therefore disappointed to find, unlike other investigators,^{6 11 12} no decrease in wound infection rate.

We considered the possibility that peeling of sutures permitted infection to be acquired in the postoperative phase. There was a highly significant correlation between peeling and infection ($P < 0.01$; table III), but though peeling was equally common in both clean and contaminated wounds there was no increase in the incidence of infection in the clean wounds in which peeling occurred. This suggests that the peeling is caused by the infection due to contamination at surgery rather than bacteria entering the wound after operation.

Difficulty in applying tapes was a feature in early cases and with experience became less frequent. Like others,^{6, 12} we found that the initial doubts of the participating surgeons gradually disappeared.

Our results show satisfactory scars in 247 of 262 (94%) tape-closed wounds, and they agree well with those of previous studies. Horton and Duffin¹³ claimed 89% linear healing in outpatient operations on children. Shepherd¹¹ considered that satisfactory scars were obtained in 478 of 507 (94%) thoracic incisions. De Paulis¹⁴ claimed excellent results in 82% and good results in a further 12% of 350 incisions closed with tapes. Though we assessed 15 wounds as being unduly wide none of the patients complained of the scar.

Though we saw no cases of allergy, which confirmed the impression of Skoog,² Gibson and Poate,¹⁵ and Shepherd¹¹ that allergic reactions are virtually unknown, blistering was seen in a few cases. This is caused by undue tension on the wound and has been recorded in most series. It occurred less frequently with increasing experience of the technique and may be eliminated by placing the first tapes parallel to the wound, especially in obese patients or those in whom considerable swelling of the wound is expected.

Subjective patient assessment of wound pain and discomfort showed clear evidence of patient preference for tapes ($P < 0.01$). Patients who have experienced both sutured and taped wounds

have usually expressed a preference for taped closure when asked which they would prefer in the future and also comment that they find it easier to move about in the early postoperative phase.

We believe that taping wounds is a useful technique that could be more widely used in general surgical practice.

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Tuberculosis among Immigrants Related to Length of Residence in England and Wales

Report from the British Thoracic and Tuberculosis Association*

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Summary

Between 1965 and 1971 the notifications of tuberculosis among lifetime residents of the British Isles declined, but among those born in India, Pakistan, and new Commonwealth countries in Africa tuberculosis notifications increased appreciably. Furthermore, the long-held suspicion that among these immigrants the most recent arrivals in England and Wales have higher rates of tuberculosis than those who have lived here longer was confirmed.

Introduction

In 1971 the British Thoracic and Tuberculosis Association (B.T.T.A.) carried out a national survey on the effect of immigration on tuberculosis notifications in England and Wales.¹ The results were compared with a survey carried out in 1965.² The following observations emerged.

(1) For persons born in the British Isles (England, Wales, Scotland, Northern Ireland, and Eire) there was a decrease of 43% in the monthly

number of notifications of tuberculosis between 1965 and 1971. By contrast, for persons born in India, Pakistan, and new Commonwealth countries in Africa and now living in England and Wales there was an increase of 68% in the monthly number of notifications. For those born in the West Indies and elsewhere there was a reduction of 26%.

(2) The 1971 Census³ showed that 95% of the inhabitants of England and Wales were born in the British Isles. They contributed 68% of the notifications of tuberculosis in 1971, the remaining 32% arising from the 5% of inhabitants who were not life-time residents of the British Isles. Even more striking, however, was the observation that those born in India, Pakistan, and new Commonwealth countries in Africa, who constitute less than 2% of the population of England and Wales, accounted for 26% of the notifications in 1971.

(3) In 1971 the notification rate for tuberculosis among those born in India and living in England and Wales was 27 times as high as that for those born in the British Isles (12 times in 1965). For those born in Pakistan it was 54 times as high (25 times in 1965).

The B.T.T.A. survey of 1971 was held in the spring of that year to coincide with the national Census. Data from the Census are now available and allow the analysis of the notifications in 1971 to be extended to compare the occurrence of tuberculosis in immigrants who had recently arrived in England and Wales with the occurrence in immigrants who had been resident for longer periods.

Plan of Survey

Physicians from 440 chest clinics in England and Wales took part and informed the B.T.T.A. of every newly notified case of tuberculosis seen in their clinics between 1 February and 31 May 1971. Altogether 3521 notifications were received (85%) out of the 4126 notifications made to the Department of Health from all sources in England and Wales. A fifth of the 15% not received by the B.T.T.A. were examined (on the basis of information derived from the local health authorities)

*The survey was carried out by a subcommittee of the Research Committee of the British Thoracic and Tuberculosis Association, whose members were: Dr. P. Stradling (chairman), Professor D. J. Newell, and Drs. A. Pines, F. Ridehalgh, A. R. Somner, V. H. Springett, and D. K. Stevenson. The co-ordinator of the survey was Dr. A. R. Somner, who also prepared the report.