PRIMARY PELVIPERINEAL CLOSURE WITHOUT DRAINAGE, AFTER ABDOMINO – PERINEAL RESECTION OF THE RECTUM – A COMPARATIVE STUDY

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SUMMARY

Our personal experience in the management of the pelviperineal space, after proctectomy for cancer, with three different approaches is, retrospectively analyzed, attempting to define the most effective one (Jan. 1973 to Oct. 1982). Until June 1978 twenty five patients (Group A) underwent what we designate as **Technique I** (suturing the pelvic peritoneal layer and packing the pelviperineal wound open). From July 1978 to July 1980 **Technique II** (pelvic peritoneum left unsutured, pelviperineal wound primarily closed without drainage) was the approach in 16 patients (Group B), while **Technique III** (pelvic peritoneum sutured, primary perineal closure without drainage) was used in 18 patients (Group C) since then. The entire series consists of 57 patients with malignant tumors and 2 with invasive villous adenomas. No significant septic complications occurred among patients handled by primary perineal closure, all perineal wounds (Groups B and C), except one, healing *per primam*. A statistically significant higher incidence of small-gut obstruction was verified among patients of Group B, as compared to A and C (p = 0.05). The rate of thromboenbolic complications was much higher in Group A patients. The postoperative hospital stay and the length of time required for complete perineal healing were noticeably longer, therefore detracting from its cost effectiveness, among patients managed by technique I, as compared to II and, particularly, III. On the whole series there was one laporotomy wound infection (1.7 %), in one patient of Group C. No major intraperitoneal sepsis developed in any patient. One patient died of massive pulmonary embolism and another one from ulcerating, diffuse enterocolitis, both pertaining to Group A, for an overall operative mortality of 3.4 %. It is concluded that primary perineal closure with suturing of the pelvic peritoneal floor, without drainage, can be safely accomplished and may be considered the ideal management of the pelviperineal space after proctectomy for cancer.

RESUMO

Encerramento primário, sem drenagem, da ferida pelviperineal após proctectomia — um estudo comparativo

Uma análise retrospectiva de uma experiência pessoal (Janeiro 1973 - Outubro 1982) no tratamento do espaço pelviperineal, após proctectomia por lesão maligna, foi levado a efeito tentando definir qual o método mais eficaz. Até Junho 1978, 25 doentes (Grupo A) manipulados pela por nós designada **Técnica I** (sutura do peritoneu pélvico, espaço pelviperineal deixado aberto com compressas iodoformadas). De Julho 1978 até Julho 1980 a **Técnica II** (peritoneu pélvico não suturado, ferida perineal encerrada primariamente sem drenagem) foi a atitude escolhida em 16 doentes (Grupo B). A partir de então o método preferido foi a **Técnica III** (peritoneu pélvico suturado, ferida perineal primariamente fechada sem drenagem) em 18 doentes. Não se verificaram complicações sépticas significativas nos doentes cuja ferida perineal foi primariamente encerrada (Grupos B e C) todas elas, com excepção de uma, cicatrizando *per primam*. Uma maior incidência de obstruções do intestino delgado, estatisticamente significativa (P = 0,05) ocorreu no Grupo B em relação aos outros grupos de doentes. A percentagem de complicações tromboembólicas foi mais elevada no Grupo A. A permanência hospitalar post-cirurgica e o período de tempo necessário para completar a cicatrização perineal foram significativamente mais prolongados no Grupo A. No total houve uma ferida de laparotomia infectada (1/59, 1,7 %) num doente do Grupo C. Em nenhum doente ocorreu sepsis intraperitoneal. Houve 2 mortes operatórias (2/59, 3,4 %), numa como consequência de Embolia Pulmonar massiça e outra resultante de enterocolite necrosante difusa, ambas confirmadas em autopsia, ambos os doentes no Grupo A. Concluímos que o encerramento perineal primário com sutura de peritoneu pélvico, sem drenagem, pode executar-se com segurança devendo considerar-se o método ideal de tratamento do espaço pelviperineal após proctectomia por cancro.

INTRODUCTION

After excising the rectum the various compartments of the supralevator space,[1] the presacral, pararectal and prerectal ones being those involved in the vast majority of resections, give rise to a huge, potentially contaminated cavity, which has to be adequately filled out and obliterated. More than one approach is applicable in handling this problem, each one of which has its own specific advantages and disadvantages. Most surgeons still prefer managing such a wound by leaving it packed open, as classically described by Miles,[2] or partially closed around a drain.[3] This would avoid serosanguineous fluid accumulation and possible abscess formation, having, as a counterpart, the need for daily irrigations with consequent patient discomfort and extra time wasted by the staff, eventually leading to a tedious healing period. Over the past 10 to 15 years though, it has become evident [4-8] that a smooth and undisturbed healing process is the rule, rather than the exception, after primary perineal closure. Irvin and Goligher,[9] in a controlled trial, did, in fact, prove the clear superiority of this type of closure but failed to demonstrate an expected shortening of the postoperative hospital stay, thereby, somehow detracting from its potential benefits and cost effectiveness. It should be emphasized that some form or another of draining the presacral space is advocated by all previously quoted authors. The real efficacy of any kind of drainage, notwithstanding, remains a controversial matter,[10] liable to be taken as a potentially harmful measure, favoring infection rather than preventing it, and delaying the patient's discharge.

We, therefore, set out to, retrospectively, analyze the senior author's experience in the management of the perineal wound, by three different technical approaches, two of them involving primary closure without any type of drainage. This report attempts to document their relative merits and setbacks in terms of clinical efficiency and cost effectiveness.

PATIENTS, METHODS

From January 1973 to Oct. 1982 a total of 59 abdominoperineal resections of the rectum were performed. Fifty seven patients suffered from malignant disease and 2 had an invasive villous adenoma. Three different technical approaches were sequentially applied in dealing with the pelvic peritoneal floor, the supralevator space and perinal wound.

Technique I (25 patients, Group A): The widely dissected pelvic peritoneal flaps were securely sutured together, the perineal wound was left wide open and the supralevator area left behind as an empty space, was filled with strips of iodoform gauze, loosely folded several times. These were removed around the fourth postoperative day; daily irrigations of hydrogen peroxide and normal saline were then started and continued until the day of discharge and after discharge 2 to 3 times a week until complete healing was achieved.

Technique II (16 patients, Group B): The pelvic peritoneal layer was left open, unsutured, allowing the small bowel loops to fill in the gap. The perineal wound was closed primarily with interrupted, vertical, deep, mattress sutures of monofilament nylon, including the cut edges of the levator muscles and surrounding adipose tissue which were left in place for three weeks. Care was taken to insert the stitches 10 to 15 mm apart, 20 mm off the skin edges and to tie them down loosely, merely approximating the tissues. No drainage was left behind.

Technique III (18 patients, Group C): The pelvic peritoneal flaps were securely fastened together and the perineal wound was closed primarily, as in Technique II. No drainage was utilized, as well.

The two-team synchronous approach was utilized routinely. All patients underwent preoperative bowel preparation as advocated by Nichols.[11] Systemic, parenteral, antibiotics (aminoglycoside plus clindamycin) were administered, intravenously, during anesthesia induction and every eight hours thereafter for the ensuing 24-36 hours.

Copious irrigation, with hydrogen peroxide, normal saline and betadine, of the peritoneal and emptied pelvic cavities, from above down, aimed at removing blood clots and devitalized tissue, as well as to detect minimal bleeding points, was carried out before suturing the peritoneal layer and/or the perineal wound.

Table 1 summarizes pertinent clinical data related to the different groups of patients. They constitute a rather uniform set, without any significant differences among them, including factors such as a low serum albumin (<2.9 gr/dl), preoperative stoma, operative blood loss >2 units, operating time >2 hours and bowel preparation, found by the Lahey Clinic group [12] and already discussed by us,[13] to be those, in fact, with significant impact as predisposing to infection after colectomy. The senior author was responsible for the entire preoperative, intraoperative and postoperative decision-making process, adding to the uniformity of the different patient groups.

Wound infections were difined according to criteria previously outlined.[13] Major intraperitoneal sepsis, respiratory or urinary tract infections, thromboembolic complications and episodes of small-gut obstruction were searched for and diagnosed by standard clinical examination, complemented by laboratory and radiographic means.

Statistical evaluation was carried out by the Analysis of Variance method (ANOVA), completed by Scheffe's Multiple Comparison method.

TABLE 1 **Clinical data, pertaining to 59 abdominoperineal resections of the rectum**

Data	Group A Technique I Jan. 73 - - June 78	Group B Technique II July 78 - - July 80	Group C Technique III Aug. 80 - - Oct. 82	Total Jan. 73 - - Oct. 82
Number	25 (42 %)	16 (27 %)	18 (30 %)	59 (100 %)
Mean Age	62 (40-71)	63 (42-75)	61 (50-74)	63 (40-75)
Male/Female	18/7	12/4	14/4	44/15
Adenocarcinoma	23	16	18	57
Villous Adenoma (Invasive)	2	0	0	2

RESULTS

Table 2 outlines the most significant data related to this operation, concerning the operative mortality and morbidity rates and the most frequent causes in the present series. A 45-year-old woman, known to have aortic and mitral valve rheumatic disease, died on the eighth postoperative day (having had a smooth postoperative course) from a massive pulmonary embolism, as confirmed by post-mortem examination. A 62-year-old man died on the twelfth postoperative day, from pesudomembranous, necrotizing, ulcerating enterocolitis, diffuse throughout the entire gastrointestinal tract, as evidenced during autopsy.

TABLE 2 **Operative mortality and morbidity rates of 59 proctectomies**

Data	Group A Tecnique I n = 25 pts	Group B Technique II n = 16 pts	Group C Technique III n = 18 pts	Total n = 19 pts
Operative Mortality	2 (8 %)	0	0	2 (3.3 %)
Mass. Pulm. Embolism	1	0	0	1
Diffuse Necrotizing Enterocolitis	1	0	0	1
Operative Morbidity	9 (36 %)	5 (31 %)	3 (17 %)	17 (28.8 %)
Small-Bowel Obstr. requiring resurgery ·	1 (4 %)	2 (12.5 %)	0	3 (5 %) ·
Small-Bowel Obstr. not requiring resurgery	0	2 (12.5 %)	0	2 (3.3 %)
Deep Venous Thromb.	3 (12 %)	0	1 (5.5 %)	4 (6.7 %)
Pneumonia, Atelect.	2 (8 %)	0	0	2 (3.3 %)
Urin. Tract. Infect. *	3 (12 %)	0	1 (5.5 %)	4 (6.7 %)
Abd. Wound Infection	0	0	1 (5.5 %)	1 (1.6 %)
Perineal Wd. Infect.	0	0	0	0
Perin. Wound. Dehisc.	0	1 (6.2 %)	0	1 (1.6 %)
Pelvic Sepsis	0	0	0	0
Intra-Abdom. Sepsis	0	0	0	0

* Only those with documented positive urine cultures are included.

Out of 59 laparotomies and perineal closures only one patient developed a laparotomy wound infection, accounting for a very low bacterial morbidity rate, which is in keeping with our previously published results.[13] One of the patients in Group B had a perineal wound dehiscence, without untoward effects, other than delaying the day of discharge, when, on the ninth postoperative day, we removed the stitches. Since then it has been our practice to remove perineal sutures only three weeks post surgery. A rather high morbidity rate was otherwise observed, particularly among patients in Groups A and B. The aspects accounting for this high rate will be further discussed, special emphasis being placed upon thromboembolic phenomena (Fig. 1) and episodes of bowel obstruction (Fig. 2).

Table 3 outlines data, submitted by the Hospital Administration as of 1981, related to the average, real, cost effectiveness per patient in the surgical department, concerning the technical procedures under consideration. Time off work which is probably the most significant economical loss to both patient and community is not accounted for. Patient discomfort and inability to resume normal life while the perineal wound is not completely healed is obviously of major concern, both to the suffering individual and the physician, factors which are, in all truth, unaccountable. Figure 3 stresses the cost effectiveness of each one of the technical approaches under evaluation.

All but one of the primarily closed perineal wounds healed *per primam*, without complications, leading to an early discharge. Complete healing was defined as whenever the perineal skin was found dry, clean, nonedematous and without evidence of seepage.

DISCUSSION

Packing the pelvic space and perineal wound open, a time-honoured [2] method of preventing infection in a potentially contaminated compartment is still a standard technique in the hands of many surgeons. Although useful in a few specific situations, it has proven to be more of a nuisance than a real asset, leading, as it does, to an extremely long healing period, the presence of persisting, draining sinuses for more than 6 months being a not rare occurrence, as noted by other authors.[6-9] According to published data [14,]

[15] the formation of a thick, leathery peel on the walls of the created space, impeding their coalescence and/or preventing the pelvic peritoneum from migrating down, is a suitable explanation. In Group A of the present series we did not observe any persisting sinus but, nevertheless, still an unusually long period of time (77 days per patient, as an average) as outlined in Table 3, was needed to achieve complete healing of the perineum. In addition, the numerous sessions of packing and irrigations, other than leading to unnecessary pain and discomfort, add to aggravating the cost effectiveness of the procedure. These facts become particularly noticeable when compared to the other methods (Techniques II and III) as outlined in Table 3 and Figure 3.
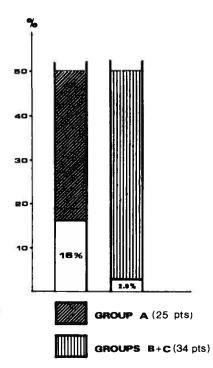

Figure 1: Incidence of thromboembolic postoperative complications — primary versus nonprimary perineal healing.
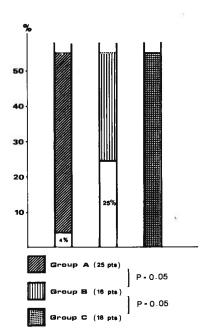
Figure 2: Incidence of small-gut obstruction in similar Groups of patients undergoing different perlviperineal reconstructions.

Figure 3: Relative cost-effectiveness of three different pelviperineal reconstructions, after proctectomy.

However, these were not the only negative findings noticed by us in our comparative analysis. The 16 percent incidence of thromboembolic phenomena (one fatal pulmonary embolus plus three cases of deep vein thrombosis) verified in Group A patients, compared to 2.9 percent among 34 patients undergoing primary perineal closure (Groups B plus C), though just failing to reach statistical value, underlines a significant trend, as Figure 1 points out. The extremely long postoperative period during which these patients have to be kept tied down to their beds, not only because the motion of getting up causes unbearable discomfort, but also because of the physician's fear of a sudden extrusion of a small-bowel loop down through the perineal opening, as compared to the early ambulation that may be confidently allowed on the first postoperative day of patients submitted to primary perineal closure, might be a suitable explanation for this difference. It is also conceivable, on a mere speculative basis, that the increased inflammatory reaction on the surrounding pelvic tissue and its rich venous plexus network eventually resulting from what we designate as Technique I, as compared to the minimally inflammatory, smooth, pelvic healing subsequent to Techniques II and III, might very well add to the difference.

Other unfavorable complications, such as urinary tract infections (Table 2), albeit having been noticed with higher frequency in patients of Group A, did not reach statistical significance. The morbidity related to the urinary tract occurs, indeed, in a rathe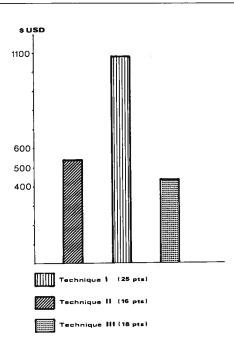r significant proportion of patients undergoing abdominoperineal resection of the rectum, infection being the most common. Several circumstances may account for it, bladder hypotonicity and stasis consequent to parasympathetic denervation appearing as the most likely.[16] We can hardly ascribe to any one of the pelviperineal reconstructive technical modalities under evaluation, the greater or lesser liability of facilitating the development of urinary infection. The same reasoning does not hold true, however, in what concerns episodes of small-bowel obstruction. A true mechanical obstruction occurs as a postoperative complication or late sequel of abdominoperineal resection of the rectum far more often than after most other abdominal operations.[17] Though in the present series we are merely considering the immediate postoperative period, our incidence of small-gut obstruction (8.3 percent) (Table 2), three of 5 patients requiring immediate resurgery, fully confirms Goligher's claim. It seems important to point out, nonetheless, that this complication has a much higher incidence among Group B patients, reaching, in fact, a statistically significant difference as compared to Groups A $(p = 0.05)$ and $C(p = 0.05)$. One can surmise that this fact is intimately related with the possibility of small-bowel loops becoming adherent and sharply kinked, low on the raw, just denuded surfaces of the narrow pelvis.Indeed, in both patients in Group B requiring reoperation, this was the cause.

Though it is not the purpose of this analysis to dwell upon the ever present,[10] albeit very ancient [18] Hamletian dilemma of *To drain or not to drain*, suffice it to say that our

TABLE 3 Cost effectiveness of three different approaches to pelviperineal reconstruction

Groups	Average postop. hosp. stay X avge daily cost ($55 USD)	Avge. nr. of days for complete healing	Avge. nr. of OPD vis. X cost per vis. ($10)	Total Hos. Cost Effect
Group A Technique I n = 25 pts	18 days (12-38) × $55 = $990 USD	77 (60-130)	18 Outpatient vis. × $10 = $180 USD	$1170
Group B Technique II n = 16 pts	10 days (7-35) × $55 = $550 USD	25 (15-45)	4 OPD visits × $10 = $40 USD	$590
Group C Technique III n = 18 pts	8 days (7-15) × $55 = $440 USD	21 (15-56)	4 OPD visits × $10 = $40 USD	$480

previous experience with many hundreds of successful, drainless, abdominal operations allowed us to start utilizing the approach herein designated as Technique III, attempting to avoid the small-bowel loops from becoming trapped in the lower pelvis by suturing the peritoneal floor, as opposed to Technique II. Judging from our results (Tables 2 and 3) it appears that not draining may represent an asset rather than a hindrance,as opposed to what is,universally, claimed,[5-7, 9] without real, valid, reasons to fear the creation of a closed space.[19] However, a painstakingly meticulous, sharp, instrumental dissection aimed at a bloodless, dry, noncontaminated pelvic field is an absolute must, if a successful application of this method is to be accomplished. Particular attention has to be paid to a thickened portion of Waldeyer's fascia, connecting the sacrum to the anorectum, which must be sharply divided with scissors, either from above or below. Whenever a forceful, blunt, digital dissection is attempted at this level, inadvertent violation of the rectal wall or the tumor itself is a rather distinct possibility of gross pelvic contamination, precluding, therefore, the usage of a better technical approach. Whenever a firm, secure suturing of the peritoneal floor is achieved, it will quickly migrate down to the lower pelvis,[20] obliterating the space and conditioning an undisturbed healing process.

CONCLUSIONS

The standard, classic approach to management of the supralevator compartment after proctectomy, designated in this study as Technique I, should be used in only a very few, specific situations, as a high morbidity rate and prolonged disability period (Tables 2 and 3, Fig 3), lead to unnecessary discomfort and poor cost effectiveness as compared to Techniques II and III.

Judging from its low morbidity rate, early discharge and excellent cost effectiveness (Tables 2 and 3, Fig. 3), Technique III appears to be the ideal method after proctectomy for cancer, provided minimal contamination, absence of devitalized tissue and a bloodless field are obtained. Only careful, thorough, sharp dissection is able to accomplish those aims. Under these circumstances no drainage is necessary.

Technique II, though liable to be considered a good method, carrying, as it does, the advantages of primary perineal closure, appears as running an unduly high,statistically significant risk of small-gut obstruction, as compared to Technique I (p = 0.05) and, particularly, Technique III (p = 0.05) (Fig. 2).

Whenever gross contamination and/or uncontrollable oozing of blood occurs, it is preferable not to apply any of the primary perineal closure techniques, most particularly Technique III. The presence of multiple perirectal and anal fistulas may represent a contraindication, as well.

Whenever a secure suturing of the pelvic peritoneum is difficult, such as it may happen after super radical operations with *en bloc* resection of the uterus, the vaginal walls and/or urinary bladder, Technique II should be the choice.

REFERENCES

1. JANKE, W. H. and BLOCK, M. A.: Chronic retroperitoneal pelvic abscesses. *Arch. Surg.* 1965; 90: 380-384.

2. MILES, W. E.: A method of performing abdominoperineal excision of the Rectum and of the terminal portion of the pelvic Colon. *Lancet* 1908; 2: 1812-1815.

3. GABRIEL, W. B.: The principles and practice of rectal surgery. 1963, 5th Edition, London, Lewis, Page 545.

4. OATES, G. D. and ALEXANDER-WILLIAMS, J.: Primary closure of the perineal wound in excision of the rectum. *Proc. R. Soc. Med.* (Suppl.) 1970; 63: 128.

5. WALTON, P. and MALLIK, M. K.: Management of the perineal wound after excision of the rectum. *J. R. Coll. Surg. Edimb.*, 1974; 19: 251-254.

6. ALTEMEIER, W. A.; CULBERTSON, W. R.; ALEXANDER, J. W. et al.: Primary closure and healing of perineal wound in abdominoperineal resection of Rectum for carcinoma. *Am. J. Surg.* 1974; 127: 215-219.

7. BROADER, J. H.; MASSELINK, B. A.; OATES, G. D. et al.: Management of the pelvic space after proctectomy. *Br. J. Surg.* 1974; 61: 94-97.

8. JALAN, K. N.; SMITH, A. N.; RUCKLEY, C. V. et al.: Perineal wound healing in Ulcerative Colitis. *Br. J. Surg.* 1966; 53: 1014-1023.

9. IRVIN, T. T. and GOLIGHER, J. C.: A controlled clinical trial of three different methods of perineal wound management following excision of the Rectum. *Br. J. Surg.* 1975; 62: 287--291.

10. MOSS, J. P.: Historical and current perspectives on surgical drainage. *Surg, Gyn, Obst.* 1981; 152: 517-525.

11. NICHOLS, R. L.; BROIDO, P.; CONDON, R. E. et al.: Effect of preoperative Neomycin-Erythromycin intestinal preparation on the incidence of infectious complications following Colon surgery. *Ann. Surg.* 1973; 178: 453-459.

12. DeGENNARO, V. A.; CORMAN, M. L.; COLLER, J. A. et al.: Wound Infections after colectomy. *Dis. Colon Rectum*, 1978; 21: 567-572.

13. ALMEIDA, A. M.; GRACIAS, W.; SANTOS, N. M. and ALDEIA F. J.: Aseptic, single-layer, anastomosis — Its possible role in minimizing sepsis after Large Bowel surgery. *Colo--Proctology*, 1982; 4: 155-160.

14. LUBBERS, E. J. C.: Healing of the perineal wound after proctectomy for non malignant conditions. *Dis. Colon Rectum* 1982; 25: 351-357.

15. SILEN, W. and GLOTZER, D.: Prevention and treatment of persisting perineal sinus. *Surgery* 1974; 75: 535-542.

16. RANKIN, J. T.: Urological complications of rectal surgery. *Br. J. Urol.* 1969; 41: 655.

17. GOLIGHER, J. C.; LLOYD-DAVIES, O. V. and ROBERTSON, C. T.: Small-gut obstruction following combined excision of the Rectum, with special reference to strangulation round the colostomy. *Br. J. Surg.* 1951; 38: 467-471.

18. YATES, J. L.: An experimental study of the local effects of peritoneal drainage. *Surg. Gyn. Obst.* 1905; 6: 473-492.

19. PEACOCK, E. E.: Comments to the paper of Walton and Mallik (Reference 5). Year Book of Surgery, Year Book Med. Publishers, Chicago, 1975, page 87.

20. RISBERG B.; KOCK, N. G.; MYRVOLD H. and NILSON, A.: Topography of reconstructed pelvic peritoneum after proctocolectomy. *Dis. Colon. Rectum* 1974; 17: 153-156.

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