

# Mass closure versus the conventional layered closure of the abdominal incision for gynaecologic and obstetric surgery.

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**Summary:** Mass closure of the vertical abdominal incision was compared with the conventional layered closure method in 200 Gynaecological and Obstetric cases. The duration of the operative procedure, cost effectiveness, morbidity and immediate postoperative complications were analysed. The complications of stitch infection, induration and dehiscence of wound were observed in both the groups postoperatively; the wound complications were found to be 8% in the conventional layered closure as compared to 2% in mass closure method which was statistically significant ( $p = 0.05$ ). Moreover the mass closure method is cost effective and has lower morbidity in immediate postoperative period. Further, during 6 months to 1 year of follow up, incisional hernia was not detected in any patient of either group. It fulfilled all the criteria for an ideal method of closure of an incision i.e. security, absence of complications, time efficiency and cost efficiency. Thus, the mass closure of the abdominal incision was found to be an effective method with low morbidity and excellent outcome.

## Introduction:

The ideal method of closing any incision must fulfill certain criteria, (i) security (ii) absence of complications (iii) time efficiency and (iv) cost efficiency (Montz et al, 1991). The conventional layered closure of the abdominal incision is associated with a high incidence of incisional hernias and wound infections following surgery for gynaecologic and obstetric indications. This was observed after a review of all the cases of incisional hernia repaired over a period of 2 years at the L.N. hospital. It was observed that out of 20 cases of incisional hernia repaired 13 were following abdominal wound closure for gynaecologic and obstetric indications. Secondly, a study of the incidence of wound infection following the conventional method of closure revealed an incidence of 8% (Batra et al, 1994)

Thus these observations prompted us to study the mass closure technique of abdominal wound using delayed absorbable suture material in gynaecological and obstetric cases. This study was undertaken to analyse the factors of suture material used, technique of closure and the abdominal wound infection in the immediate post operative period which might have a bearing on the development of late incisional hernia.

## Material and Method:

This study was carried out in the Dept. of Obstetrics and Gynaecology of M.A.M. College, New Delhi. Two

hundred patients of vertical incisions for various gynaecologic and obstetric indications were included in this study. Out of these, 100 were randomly closed by the mass closure technique using continuous delayed absorbable suture material (polyglactin : violet vicryl) no. 1. The mass closure included the peritoneum, medial one third of the rectus muscle and the rectus sheath. The skin in both methods was closed by interrupted mattress sutures using nonabsorbable monofilament polypropylene black no. 2 - 0. The remaining 100 patients which were used as control were closed by the conventional layered method using continuous sutures of chromic catgut no. 0 for the peritoneum and violet vicryl suture no. 1 for the sheath. Both the group of patients belonged to the similar socioeconomic status, age group and parity. Both the groups received similar antibiotics.

## Results

In the immediate postoperative period i.e. upto 7 days serous collection was observed in 2 cases out of 100 i.e. 2% of mass closure. However none had wound dehiscence or wound infection. During the follow up period of 6 months to 1 year none had incisional hernia or wound infection. In the control group the infection rate was 8% and there was no incisional hernia. The average time taken for mass closure of abdomen was 6 min. and for layered closure 7 min. (Table I)

Table I

Observation	Age	Parity	Wound Infection	Incisional Hernia	Average time for Closure
Mass Closure n=100	20-60 yrs	0-5	2%	None	6 Min
Conventional Layered closure n=100	20-64 yrs	0-5	8%	None	7 Min
			P=0.05 significant		

## Discussion

Traditionally, abdomen is closed in multiple layers using absorbable sutures, however, this technique is time consuming, tedious and results in unequal tension which may promote wound infection. In the recent past continuous mass closure techniques using delayed absorbable sutures have been used in selected patients with good results (Masterson, 1991; Rubio, 1991). For closure of anterior wall, besides asepsis and antibiotics proper suture material and suturing technique can help in reduction of postoperative wound complications (Chowdhury, 1994). In the conventional layered method of closure absorbable suture is used for the peritoneum and delayed absorbable suture for the rectus sheath, hence two additional knots have to be applied and secondly, since the peritoneum and rectus sheath are sutured separately a potential space exists between the two. These features encourage collection and bacterial growth and may cause sepsis of the wound. Continuous mass closure technique is quick, cost effective and because of an even distribution of tension along the suture line obliterates all potential space, thereby preventing haematoma formation, infection and wound disruption. The wound in continuous closure is exposed to minimal amount of suture material and only two knots, hence, the growth of infectious organisms is discouraged (Rubio, 1991). Running sutures strangulate less tissue than interrupted ones, so the likelihood of dehiscence is reduced (Hoffman et al, 1991; Richards et al 1983). It is proposed that with an interrupted closure, the tension is focused on each individual stitch, hence dehiscence would begin at the stitch where the tension exceeds the suture holding capacity of the fascia (Montz et al, 1991). The Fascia

regains its tensile strength very slowly. It is estimated that fascia regains 50% of the original strength by 2 months and full strength by 1 year or so. Thus absorbable sutures are inappropriate for fascial closure as they dissolve much before the tissue is healed completely (Stephenson, 1977). Nonabsorbable sutures on the other hand are potential site of foreign body reaction and growth of pathogenic organism. The use of delayed absorbable/suture allows adequate fascial support until indigenous healing has occurred and eliminates the occurrence of chronic incisional pain (Poole, 1985). The mass closure of the abdominal wound with continuous delayed absorbable suture in gynaecological and obstetric cases appears to be a rational technique. The excellent clinical results achieved in this preliminary study confirms the advantages of using continuous delayed absorbable sutures for the closure of the vertical abdominal wound. During a follow up period of 6 months to 1 year, these patients presented with no dehiscence or infection and have experienced no incisional pain except immediately after operation. In neither of the groups we observed any incisional hernia and this may be because of the use of delayed absorbable suture. Thus, the authors conclude that the mass closure technique with continuous delayed absorbable sutures is satisfactory for all vertical incisions in Gynaecological and Obstetric cases with excellent result.

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