

Comparison of Single Layer Closure with Conventional Multilayer Closure of the Abdominal Wall in Caesarean Section.

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Summary

Increase in the caesarean section rate during past few years has lead to increasing number of complications. In any abdominal surgery, the correct method of abdominal closure is of paramount importance. In quite a number of cases the technique of abdominal closure is either responsible or contributes to these complications.

The present study was carried out in the Department of Obstetrics and Gynaecology, S. N. Medical College & Hospital, Agra on 177 patients. Out of which 87 patients were subjected to single layer closure with non absorbable monofilament polyamide suture material. We have found good results with regards to lesser incidence of complications and better economy.

It was concluded that the single layer closure with monofilament polyamide suture material, is very effective in reducing the time period of abdominal closure, in 68.97% of cases it was only 4-6 minutes, incidence of wound dehiscence was found in only in one case, healing by first intention was found in 98.85%, no hypertrophy of scar and incisional hernia was seen in any of these cases and lastly reduction in the period of hospital stay.

Introduction

Any mistake in method of closure or ill judgement in selection of suture material may result in immediate and late complications. In emergency caesarean section, as compared to elective, the complications are far more common and sometimes present serious problems which may be of great concern to the patient as well as to the operating surgeon.

The standard practice of closure of caesarean wound was a multilayer closure with chromic catgut or vicryl. These have shortcomings which include their variable strength, unpredictable absorption in tissue which is influenced by secretion and tissue enzymes significant tissue reactions (Madson, 1953a, 1953b, 1958) susceptibility to infection (Alexander and Pruden 1966), fraying when handled and weakening after knotting. Despite these, they continue to be used by surgeons who have learned to adjust to its imperfection.

Single layer closure with monofilament polyamide is an ideal technique during closure of the abdominal wall in caesarean section. It provides an opportunity not only to prevent infections but also to reduce the incidence of wound dehiscence.

Material And Methods

The study is based on 177 patients, who were admitted in the department of Obstetrics & Gynaecology, S. N. Medical College, Agra, during the period from December 1998 to December 2000.

The cases were divided into 2 groups

Group – I: Included 90 cases with abdominal closure by multilayer technique. The first layer was of a continuous suture of peritoneum by chromic catgut no. 1 or vicryl no. 1, the second layer was of continuous suture of rectus sheath by vicryl no. 1 and the third layer included

subcutaneous tissue (only in obese patient). Lastly the skin was closed with interrupted linen in mattress fashion.

Group – II : Included 87 cases with abdominal closure by single layer technique. The parietal peritoneum, rectus sheath and a part of subcutaneous tissue (only in obese patients) were approximated by a single layer with monofilament polyamide using round body needle. The skin was closed in the separate layer using interrupted suture, mostly by linen.

Drain when used was inserted through a separate wound away from the main incision. All patients were kept on antibiotic postoperatively. Superficial and deep wound sepsis was recorded during dressing of the wound by noticing the discharge of purulent fluid or pus.

Burst abdomen was taken as one, when all layer of anterior abdominal wall had given way, heralded by discharge of peritoneal fluid which was serosanguinous in nature.

Observation

Table-I shows time required in closure of abdomen following caesarean section. The closure time in the study group in maximum number of cases (98.85%) ranging between 4-8 minutes whereas it was more, ranging between 6-12 minutes in most of the cases (94.44%) in the control group. The difference in time in closure of abdomen was statistically significant ($p < 0.01$).

Table-II shows distribution of cases according

to incidence of wound dehiscence in the postoperative period in the two groups. It was found that 4.44% cases in the control group and 2.30% cases in the study group developed partial wound dehiscence, 6.67% in the control group and only 1.15% of the cases in the study group developed complete wound dehiscence. 88.89% and 96.55% of cases in control and study series respectively were not found to develop wound dehiscence.

Table – III shows incidence of hypertrophic painful scar in the control and the study group, following healing of the surgical wound. None of the cases in the study group developed hypertrophic painful scar compared to control group, where 4 (4.44%) cases were recorded with this complication. There is a significant difference between the two groups statistically.

Table – IV shows incidence of incisional hernia in the two groups and it was found that 1 case (1.11%) developed incisional hernia in the multilayer closure technique whereas none of the cases developed this complication in the patients subjected to single layer closure.

Table-V shows distribution of cases according to hospital stay in days in the control and the study group. The hospital stay period was lesser than 10 days in 67.52% of cases in the study group and in 42.22% of cases in the control group. A significant difference is found between the two groups ($p < 0.01$).

Discussion

It is probably no exaggeration to state that in

Table I
Distribution of Cases According to Time Required in Closure of Abdomen in the Control & Study Group

Closure of Abd. (time in minutes)	Control Group (n=90)		Study Group (n=87)	
	No. of Cases	%	No. of Cases	%
0-2	-	-	-	-
2-4	-	-	1	1.15
4-6	-	-	60	68.97
6-8	31	34.44	26	29.89
8-10	25	27.78	-	-
10-12	29	32.22	-	-
>12	5	5.56	-	-
Mean	8.89		5.21	
SD+	1.80		0.88	
t		16.253		
p		<0.01		

Table – II

Distribution of Cases According to incidence of wound Gaping and Wound Dehiscence in the Postoperative Period in the Control & Study Group.

Type of wound (dehiscence)	Control Group (n=90)		Study Group (n=87)	
	No. of cases	%	No. of cases	%
Partial wound Dehiscence	4	4.44	2	2.30
Complete wound Dehiscence	6	6.67	1	1.15
	Partial wound Dehiscence		Complete wound dehiscence	
Z	0.792		1.925	
P	>0.05		>0.05	

Table III

Distribution of Cases According to incidence of Hypertrophic Painful Scar in the Control & Study Group

Type of scar	Control Group (n=90)		Study Group (n=87)	
	No. of Cases	%	No. of cases	%
* Hypertrophic scar	4	4.44	-	-
No hypertrophic scar	86	95.96	87	100.00
Total	90	100.00	87	100.00
	Z = 2.041,		p < 0.05	

* Hypertrophic scar – clinically these scars are red, raised, itchy and tender

Table IV

Distribution of Cases According to incidence of Incisional in the Control & Study Group.

Incisional Hernia	Control Group		Study Group	
	No. of Cases	%	No. of cases	%
Incisional hernia present	1	1.11	-	-
Incisional hernia absent	89	98.89	87	100.0
Total	90	100.00	87	100.00

Z = 1.001, p > 0.05

Table V

Distribution of Cases According to Hospital Stay in Days in the control & study group.

Type of wound (dehiscence)	Control Group (n=90)		Study Group (n=87)	
	No. of cases	%	No. of cases	%
< 10	38	42.22	57	65.52
10-15	31	34.44	23	26.44
>15	21	23.3	7	8.05
Mean	11.84		8.60	
SD +	3.42		0.94	
T	8.530			
P	<0.01			

infraumbilical abdominal surgery, wisely chosen incision and correct method of making and closing of such wounds are factors of great importance.

Out of all odd factors, there are two areas where an obstetrician can exercise their judgement to safeguard against operative complications; these are –

- i) Selection of proper technique of caesarean wound closure.
- ii) Selection of proper suture material.

This reduces the morbidity and unnecessary stay of patient in the hospital, besides expenditure on medication and also mortality by reducing the incidence of burst abdomen.

Impelled by these ideas, we designed a study in which we used a single layer closure technique over more conventional multilayer closure technique.

In the present study monofilament polyamide has been used as it fulfilled almost all criteria of an ideal suture material required for wound closure. It is an inert suture material which has greater tensile strength, which is not affected by the presence of infection, hence can be used in infected fields. But it has certain short-comings like knot slippage which may be overcome by tying with three reef knot or by keeping the ends of the thread way beyond the knot.

It is inexpensive, as compared to most of the sutures with hospital cost rising, this economy is considerably significant at least in our country. We have anticipated considerable reduction in the possible complication by using monofilament polyamide in our technique of single layer closure in the caesarean wound.

The time required in closure of abdomen during caesarean operation revealed interesting results. The closure time noted in cases with single layer closure technique was only 4-6 minutes in majority (68.97%) of cases. Contrarily it was much longer, 6-8 minutes in the control series with multilayer closure technique. We presume that single layer stitching of caesarean incision

would take shorter time than suturing layer after layer in multilayer suturing technique.

Regarding wound discharge which is indicated of wound infection Tagart (1967) emphasized the superiority of monofilament suture over other kinds of suture, our findings are in agreement with observation of these authors and concluded that nonabsorbable monofilament resists the infection best.

No case of hypertrophic scar and incisional hernia was seen in the study group.

The hospital stay period in operated patients has important economical impact on hospital as well as on patients expenditure. It was worked out in patients subjected to single layer closure technique and the results were very encouraging. The hospital stay period was just lesser than 10 days in 65.52% of cases.

Conclusion

From this study, it has been possible to arrive at the following conclusion :

1. Single layer closure with monofilament polyamide suture material is very effective in decreasing the time period required to close the abdomen and also in reducing the total operating time.
2. The method is very effective in reducing the incidence of wound infection, wound dehiscence, painful hypertrophic scar and incisional hernia and gives a better quality of wound healing.
3. The use of this method has decreased the period of hospital stay thus, this techniques fits the economic burden in patient as well as hospital in much quicker time.

References

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