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UTERINE COMPRESSION SUTURES AND VASCULAR LIGATION AS AN ALTERNATIVE TO HYSTERECTOMY FOR SEVERE ATONIC POSTPARTUM HAEMORRHAGE – A RETROSPECTIVE STUDY IN THE TERTIARY CARE HOSPITAL

Obstetrics & Gynaecology

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ABSTRACT

AIM: To evaluate the efficacies of uterine compression sutures and vascular ligation as an alternative to hysterectomy for severe postpartum haemorrhage and to study the associated factors leading to hysterectomy. **Methods:** A retrospective study was carried out from May 2021 to April 2024 at a tertiary obstetric hospital and included 200 women who underwent uterine compression sutures (B-Lynch sutures, transverse sutures and anteroposterior sutures) for primary postpartum haemorrhage. Forty-four of these women had additional haemostatic procedures performed for control of bleeding. **Results:** Of the 156 women who were primarily treated with uterine compression sutures only, the success rate was 95.31% (149/156). In women with uterine compression sutures and additional haemostatic procedures performed, the success rate was 97.68% (43/44). The mode of delivery (P=0.001), place of delivery (P=0.040) and time delay (P=0.000) were the significant factors associated leading to hysterectomy. Age, parity, type of pregnancy and previous uterine surgery didn't show any significant relation with severe PPH and uterine preserving surgery. **Conclusion:** Uterine compression sutures with additional haemostatic procedures are effective to control postpartum haemorrhage and avoids hysterectomy.

KEYWORDS

uterine compression sutures, vascular ligation, postpartum haemorrhage

INTRODUCTION

Postpartum hemorrhage (PPH) is defined as blood loss of 500 mL after vaginal delivery or 1000 mL after cesarean section.[1,2] Another definition of PPH is a reduction in the patient's hematocrit level of more than 10% compared with the prenatal value or blood loss causing hemodynamic instability requiring blood transfusion.[3] PPH is an important cause of maternal morbidity and one of the first causes of maternal mortality even in industrialized nations.[4] According to WHO, about 140,000 maternal deaths occur every year due to PPH of which 94% occur in developing countries.[5]

Atonic PPH is the most common cause of PPH. When the 1st line non-invasive measures like uterotonics, uterine massage & intrauterine balloon tamponade fails, second line procedures like compression sutures, surgical vascular ligation or radiological embolization should be done immediately to avoid hysterectomy and maternal mortality.[6]

In 1997, B-Lynch et al[7] introduced the B Lynch compression suture. Since then, various uterine compression sutures have been described with the inventor's name being used such as Hayman[8], Cho[9], Pereira[10], Ouahba[11] or Hackethal suture[12].

Uterine compression sutures have proved to be valuable in the control of massive atonic PPH as an alternative to hysterectomy.[13] Hysterectomy is the usual last course of action dreadfully depriving the women of any future chance of pregnancy.[14]

Postpartum hysterectomy not only leads to infertility but may also be associated with surgical difficulties and complications including injury to adjacent organs such as bladder and ureters and SSI.[15] Uterine compression sutures are technically easier to perform than pelvic arterial ligation and do not need additional facilities/infrastructure.[16]

Vascular ligation procedures like uterine artery ligation and internal iliac artery ligation are commonly performed in cases of severe PPH. The aim of this study is to evaluate the efficacy of compression sutures and vascular ligations in avoiding hysterectomy in severe PPH after failed medical management.

METHODS

All the patients with severe atonic PPH after failed medical management requiring surgical intervention were included in the study. Data was collected from various registers in the department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Manipur from May 2021 to April 2024. Data analyzed using Statistical Package for Social Sciences software version 20. Descriptive statistics like frequencies and percentages were used to study the baseline demographic characteristics, types of sutures & the cause for hysterectomy. Statistical significance was fixed at P value of <0.05. Association between numerous variables and the successful or failed control of hemorrhage were determined using Chi square test.

Inclusion Criteria

Patients with atonic PPH after failed medical management

Exclusion Criteria

Patient with PPH due to trauma, coagulopathy, retained placenta.

RESULTS

A total of 200 patients with atonic PPH after failed medical management, were studied for the outcome of uterine preservation with the intervention of uterine compression sutures and vascular ligation.

Table 1: Association Of Various Factors With Hysterectomy

Variable	Category	Successful control of hemorrhage	Failure to control hemorrhage	Chi square value	P value
Age	<35 years	147 (96.1%)	6 (3.9%)	0.010	0.919
	≥35 years	45 (95.7%)	2 (4.3%)		
Parity	Nullipara	92 (95.8%)	4 (4.2%)	0.013	1.000
	Multipara	100 (96.2%)	4 (3.8%)		
Mode of delivery	Vaginal delivery	0 (0%)	2 (100%)	48.485	0.001*
	Cesarean section	192 (97%)	6 (3%)		
Type of pregnancy	Singleton	176 (95.7%)	8 (4.3%)	0.725	1.000
	Multiple	16 (100%)	0 (0%)		
Previous uterine surgery	Yes	39 (95.1%)	2 (4.9%)	0.104	0.668
	No	153 (96.2%)	8 (3.5%)		
Place of delivery	Institution	192 (96.5%)	7 (3.5%)	24.121	0.040*
	Home	0 (0%)	1 (100%)		

Time delay	≤1hr delay	192 (99%)	2 (1%)	148.454	0.000*
	>1hr delay	0 (0%)	6 (100%)		

*P value ≤0.05 was considered statistically significant.

Our study also showed significant relationship between the mode of delivery, time delay in suture placement, place of delivery and control of haemorrhage.

Vaginal delivery attributes to high risk of hysterectomy. Patient delivering by vaginal route usually undergo initial conservative management. There is a delay in placement of compression suture which indirectly accounts for increased rate of failure of uterine preserving surgeries and increased in hysterectomy rate. On the contrary, caesarean section negates the delay in placement of compression suture or vascular ligation.

Significant association between time of placement of compression suture and successful control of PPH was recorded. Compression sutures placed with an hour of detection of severe PPH, effectively eliminates the need for hysterectomy. we also observed that home deliveries were indirectly associated with increased rate of hysterectomy due to delay.

Age, Parity, Type of pregnancy and previous uterine surgery had no significant relation with uterine preserving surgeries and control of haemorrhage.

Table 2: Number Of Women Treated With Specific Uterine Compression Sutures And Number Of Hysterectomies Performed.

Type of suture	Women (n)	Women undergone hysterectomy n(%)
B Lynch & modified B lynch suture	33	1 (3%)
Unnamed Transverse suture	66	3 (4.5%)
Hayman Suture	101	4 (3.96%)
Total	200	8 (4%)

Table 2 illustrates women undergoing hysterectomy and the type of sutures used.

Of these 200 women who were managed surgically for PPH, Hayman sutures was used in 101, transverse sutures were used in 66 & 33 patients received B lynch and modified B lynch sutures. Hysterectomy rate was highest in patients who received unnamed transverse sutures (4.5%) followed by those who received Hayman sutures (3.96%). Least percentage of hysterectomy was observed in patients who received B lynch and modified B lynch sutures.

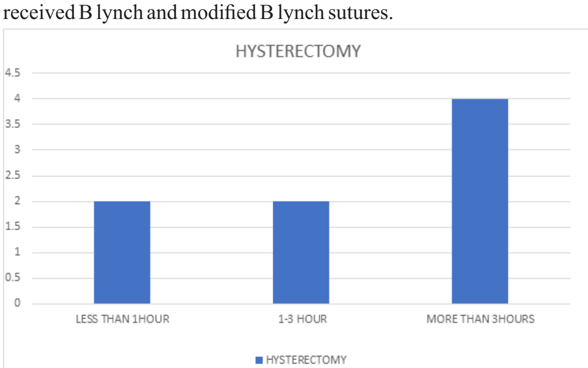

Figure 1: Relationship between delay in placing compression sutures and hysterectomy rates

Table 3: Hemostatic Techniques Vs Hysterectomy Rates

Sutures	Women	Women undergoing hysterectomy	Hysterectomy rates
Only Uterine compression sutures	156	7	4.48%
Additional Vascular ligation (uterine artery and internal iliac artery)	44	1	2.27%

Figure 1 shows that the hysterectomy rates is doubled when compression suture placement is delayed by >3 hours. Among 200 patients, 194(97%) received compression sutures within 1 hour, 2 patients (1%) within 1-3 hours, and 4 patients (2%) in over 3 hours. Each of the 6 patients who had sutures placed after 1 hour ended up in hysterectomy, while only 2 of the patients treated within 1 hour required one.

From the above table it is evident that, hysterectomy rates were reduced by >50% when vascular ligations were combined in addition with compression sutures.

DISCUSSION

Uterine compression sutures controlled PPH in 96% of study population, while it failed in 4% of patients thus requiring hysterectomy. Similar results were observed in El-Sokkary et al[17] and Smith KL et al[18] with 95% & 96% efficacies respectively.

Our study also discovered that overall hysterectomy rates were 4% which again reduced to 2.3% with additional vascular ligation techniques. Cekmez Y et al[19] & Kwong LT et al [20] observed similar results with surgical methods to control atonic PPH.

Kayem G et al[16] & Huang YY et al [21] proved that prolonged delay of 2-6hours between delivery and compression suture was independently associated with a fourfold increase in the odds of hysterectomy. We found significant relationship between the time of placement of compression suture and the rate of hysterectomy. When the compression suture was applied in less than 1hour, the rate of hysterectomy was 1%. And with time delay of more than one hour the rate of hysterectomy was the highest in the study.

CONCLUSION

Our study proved significant relationship between delayed placement of compression suture and hysterectomy rate. Placement of compression suture and vascular ligation with in an hour in cases of severe atonic PPH avoids hysterectomy. Uterine compression sutures and vascular ligation procedures proved to be efficacious overall in avoiding hysterectomy in severe PPH patients favouring women preferring fertility preservation.

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