

# The Efficacy of Different Methods of Haemostasis for Postpartum Haemorrhage

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The team of authors has no conflict of interest Agababyan L.R.

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**Abstract.** There are many methods for stopping postpartum haemorrhage. However, ascertaining the timeliness and indications for the most effective, minimally bleeding and organ-preserving method is important to preserve a woman's life and health.

**Purpose:** To study the efficacy of different methods of hemostasis for massive postpartum haemorrhage.

**Material and methods.** A retrospective analysis of the course of the postpartum period in 91 patients with postpartum haemorrhage was performed to determine the efficacy of different methods for stopping obstetric haemorrhage, of which 46 (50.5%) were delivered through natural childbirth, and 45 (49.5%) were delivered by caesarean section. Our analysis was guided by the procedures outlined in the National Standards for Improving the Quality of Perinatal Care in Obstetric Institutions of the Health System of the Republic of Uzbekistan (Tashkent, 2017) and the Collection of Clinical Protocols in Obstetrics (Tashkent, 2019).

**Results.** The most effective method of stopping postpartum atonic bleeding is laparotomy surgery, ligation of the internal iliac artery. However, studies have shown that doctors often resort to this method when there is heavy bleeding as a result of prolonged conservative measures. This has led to the need to expand the scope of surgical intervention to a radical operation: uterine extirpation. B-Linch suturing may be an effective method for the development of uterine atony during caesarean section but this method is not common enough in the Samarkand maternity hospital practice.

**Key words:** *postpartum haemorrhage, uterine atony, methods of haemostasi*

**Topicality.** Although maternal mortality has declined slightly in recent years, its cause pattern in most developing countries remains largely unchanged (WHO, 2015). Obstetric haemorrhage has always been and remains the most dangerous complication of pregnancy, childbirth and the postpartum period, leading to death and disability of women. Massive postpartum atonic haemorrhage is responsible for 25% of maternal deaths (1,2). Each year, 125000-130000 women worldwide die from obstetric haemorrhage. Most work in this area has focused on bleeding in the early postpartum period. However, the incidence and complications of postpartum haemorrhage are virtually unchanged. Maternal mortality associated with obstetric hemorrhage in our country is 44% of all causes.

Results. Bleeding arrest was carried out in 3 stages. At the first stage the interventions were aimed at:

- Increasing the contractility of the uterus (uterotonic drugs - oxytocin, 40 IU in 500.0 drops of physiological solution, at a rate of 60 drops per minute).
- Suturing of lacerations in the trauma
- Removal of the rest of the placental tissue
- Determination of the state of blood clotting

In the first step of stopping the bleeding 40 (87%) patients delivered through natural childbirth underwent manual uterine cavity surgery. Table 1 presents the indications for manual uterine cavity examination as the first step in stopping postpartum haemorrhage.

**Table 1**

**Indications for manual examination of the uterine cavity**

Indications	Number of patients
Uterine atony	23 (57,5%)
Placental defect	9 (22,5%)
Control for uterine scarring	5 (12,5%)
Intimate insertion of the placenta	2 (5%)
The true accretion of the placenta	1 (2,5%)
Total	40

All patients underwent simultaneous intravenous drip injection of 40 IU of oxytocin in 500 ml of physiological solution at a rate of 60 drops per minute.

All patients received a simultaneous intravenous drip injection of 40 IU of oxytocin in 500 ml of saline at a rate of 60 drops per minute. The algorithm for controlling haemorrhage in postpartum women after spontaneous delivery an infusion and transfusion therapy to replenish the bicarb was included.

to replenish the BCC. All the patients received crystalloids (physiological solution) in the volume of 2000-2500 ml; 39 (84.8%) women at childbirth underwent the infusion of 600-1000 ml of CSF.

Abdominal aortic constriction was used as a second, temporary measure to stop bleeding in 33 (71.7%) patients, and uterine bimanual compression was applied in 13 (28.3%) patients.

45 (49.5%) patients were delivered by caesarean section. Uterine atony is known to be one of the most common complications of caesarean section. An emergency caesarean section was performed in 22 cases and a planned caesarean section in 23 cases. An elective caesarean section in 13 (28.9%) patients developed atonic hemorrhage of up to 2000ml, which required additional surgical treatment intraoperatively. Blood loss as a function of the duration of conservative therapy until final surgical stoppage of bleeding during emergency caesarean section is shown in Table 2.

**Table 2.**

**Blood loss during emergency caesarean section and time of onset of surgical stoppage of atonic haemorrhage (n=22)**

Pre-surgical initial blood loss (ml)	Duration of conservative treatment		
	Upto 1 hour	1 hour 01 min - 2 hours	More than 2 hours
1000-1500	5 (22,7%)	-	-
1501-2000	4 (18,2%)	2 (9%)	1 (4,5%)
2001 и более	3 (13,6%)	2 (9%)	5 (22,7%)

Table 2 shows that in emergency caesarean section, additional surgical haemostasis was undertaken immediately after uterine closure in 12 (54.5%) when atonic haemorrhage developed intraoperatively. It is important to note that in 3 patients with intraoperative uterine atony, the volume of blood loss before the final surgical hemostasis was over 2000 ml. In 4 (18.2%) mothers, relaparotomy and additional surgical hemostasis were performed within 2 hours after caesarean section for blood loss greater than 1500 ml and ongoing bleeding. In 6 (27.3%) patients bleeding persisted for more than 2 hours, in 5 of whom the volume of blood loss exceeded 2000 ml and only then was the decision made for relaparotomy and surgical hemostasis.

The duration of conservative therapy for postpartum haemorrhage is shown in Table 3.

**Table 3**

**Duration of conservative treatment of postpartum haemorrhage and volume of blood loss before laparotomy for spontaneous delivery (n=46)**

Blood loss in stages I-II	Duration of conservative treatment		
	Upto 1 hour	Upto 1 hour	Upto 1 hour
1000-1500 мл	3 (6,2%)	6 (13%)	5 (10,9%)
1501-2000 мл	2 (4,3%)	2 (4,3%)	6 (13%)
2001-2500 мл	-	5 (10,9%)	9 (19,6%)
Более 2500 мл	-	3 (6,2%)	5 (10,9%)

As shown in Table 3, the duration of conservative therapy was up to 3 hours. Only in 10.5% of cases conservative therapy was carried out for up to 1 hour. These were patients with true placenta accreta and with a uterine rupture diagnosed during manual examination of the uterine cavity. In 8 patients with blood loss exceeding 2500 ml, the duration of conservative therapy was unreasonably long.

In order to stop postpartum haemorrhage, regardless of

The following methods of definitive bleeding stopping were attempted regardless of the mode of delivery, shown in Table 4.

**Table 4**  
**Volume of surgical treatment for postpartum haemorrhage**

Scope of surgical intervention	Number of patients		
	Delivery	Caesarean section	Total
Bi-Lynch sutures	-	2(4,4%)	2(2,2%)
Uterine extirpation	27 (58,7%)	28(62,2%)	55(60,4%)
Inner iliac artery ligation	19 (41,3%)	15(33,3%)	34(37,4%)
Total	46	45	91

Radical surgery was performed in cases of blood loss greater than 1500 ml and persistent bleeding, as well as in cases of associated coagulological disorders, which occurred in 27 women - 29.7%. We further studied the volume of blood loss associated with surgical haemostasis. The results of the examination in spontaneous labour are presented in Table 5.

**Table 5**

**Blood loss before and after surgical hemostasis for uterine atony after spontaneous labour (n=46)**

Initial blood loss before surgical haemostasis (ml)	Additional blood loss after surgical haemostasis (ml)			
	Up to 500	501-1000	1001-1500	Более 1500
Up to 1500	10(21,7%)	-	-	-
1501-2000	12 (26%)	8(17,4%)	8(17,4%)	3(6,5%)
More than 2000	3 (6,5%)	2(4,3%)	-	-

Analysing the volume of blood loss in uterine atony before final surgical hemostasis, it can be noted that 15 of 25 patients had a blood loss of more than 1500 ml. In 10 patients, the final stopping of bleeding was initiated when the blood loss exceeded 1000 ml. At the same time, bleeding continued in all patients surveyed by the time of surgical hemostasis. It should be noted that the least blood loss occurred during ligation of the internal iliac arteries. After VPA ligation both after spontaneous delivery and after caesarean section additional blood loss was observed, but it was within 500ml. However, due to coagulopathy, in 21 (45.7%) women who gave birth through natural childbirth, bleeding continued after the operation on the main vessels. Bleeding was eventually stopped by conservative measures aimed at improving the function of the haemostasis system. Of particular note, 27(58.7%) after spontaneous delivery and 28(62.2%) after caesarean section underwent radical surgery, uterine extirpation without appendages, due to persistent bleeding on coagulopathy.

Table 6 shows that 25(55.6%) patients with uterine atony after operative delivery underwent inner iliac artery ligation with positive effect and minimal blood loss.

**Table6.**  
**Blood loss before and after trunk ligation in uterine atony after caesarean section (n=45)**

Initial blood loss to inner iliac artery ligation (ml)	Additional blood loss after inner iliac artery ligation (ml)			
	До 500	501-1000	1001-1500	Более 1500
Upto1500	9(20%)	12(26,7%)	-	-
1501-2000	14(31,1%)	5(38,5%)	-	-
Morethan2000	2(4,4%)	1(2,2%)	1(2,2%)	1(2,2%)

When comparing delivery methods, it is noteworthy that massive haemorrhage is equally common after spontaneous delivery and caesarean section. Nevertheless, caesarean section should be considered as a risk factor for atonic uterine haemorrhage. When bleeding occurred in the postoperative period, uterotonics and infusion therapy were also administered.

#### Conclusions:

1. Surgical methods of hemostasis should be used when the first and second stage bleeding control measures are ineffective, without regard to the amount of blood loss.
2. In case of blood loss exceeding 1500 ml, duration of conservative therapy for more than 2 hours is not tactically justified.
- (3) Surgical hemostasis by ligation of the internal iliac arteries is an effective method of atonic haemorrhage stopping, which has minimal extra blood loss if performed in time.

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