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**SURGICAL HEMOSTASIS
OF POSTPARTUM
HEMORRHAGE**

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SURGICAL HEMOSTASIS
OF POSTPARTUM HEMORRHAGE

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The manual presents up to date information about surgical management of obstetric bleeding. Based on experimental and clinical data obtained at the Chair of Obstetrics and Gynecology at the Volgograd State Medical University, an algorithm of care for the woman in labor using laparotomy is proposed, as well as practice suggestions. Clinical cases and tests are included as a means of learners' performance assessment. The manual is intended for postgraduate and refresher training in obstetrics and gynecology.

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Contents

1. AIMS AND OBJECTIVES OF THE COURSE	4
2. THEORY	4
<i>a. Importance of the issue of obstetric hemorrhage</i>	4
<i>b. Blood supply to lesser pelvis organs</i>	5
<i>c. Options for surgical hemostasis in uterine hemorrhage</i>	5
<i>d. Algorithm of actions after laparotomy</i>	7
<i>e. Uterine artery embolization</i>	10
3. PRACTICAL TRAINING	12
<i>Topographic anatomy of internal genitals</i> <i>and their blood supply</i>	12
<i>Technique of ligating uterine arteries at two levels</i>	14
<i>Uterine compression technique</i>	16
<i>Placement of B-Lynch sutures</i>	16
<i>Placement of Pereira sutures</i>	19
<i>Ligation of internal iliac arteries</i>	20
4. OUTCOMES OF EXPERIMENTAL STUDY	21
5. CLINICAL CASES	24
6. TESTS	27
7. KEYS TO TESTS AND CLINICAL CASES	31
7. KEYS TO TEST QUESTIONS	33
8. REFERENCES	34

1. Aims and objectives of the course

The aim of the present course is to help learners master the algorithm of actions and surgical techniques used in surgical management of postpartum hemorrhage so as to minimize the blood loss and preserve the woman's reproductive function.

Objectives of the course

- 1) Understanding the importance of managing postpartum hemorrhage taking into consideration the statistical data. Specifying the factors affecting the outcome of postpartum hemorrhage management.
- 2) Specifying the topographic anatomy of great vessels in the lesser pelvis and ureter.
- 3) Studying the algorithm of actions aimed at arresting postpartum hemorrhage starting after laparotomy.
- 4) Learning the technique of ligating uterine and internal iliac arteries using computerized simulators and phantoms.

2. Theory

a. Importance of the issue of obstetric hemorrhage

Despite the efforts of obstetricians gynecologists and health care providers worldwide, obstetric hemorrhage still remains number one cause of maternal death. Over 200 thousand puerperant women die annually of obstetric hemorrhage, with predominance of postpartum hemorrhage due to uterine hypotonia.

According to the WHO recommendations the first line drugs for prevention of hypotonic hemorrhage during a cesarean section are oxytocin, oxytocin + methylergometrine and misoprostol (first level of evidence). However, it is admitted that the effectiveness of medicinal prevention and surgical hemostasis during surgery is no higher than 70%. Uterotonics can be expected to work while the uterus still retains the ability to contract. Their ineffectiveness can be probably explained by disturbances in the homeostasis system, trophism disturbances in the myometrium and engorgement of the myometrium with blood.

A quotation from guidelines by the Royal College of Obstetricians and Gynecologists (2009) is an indication of the limited possibilities of uterotonics familiar to all practicing obstetricians: "Misoprostol is not so effective as oxytocin but when oxytocin does not work, one can administer misoprostol, in managing home delivery in particular..." (6).

b. Blood supply to lesser pelvis organs

"The main source of blood supply to the lesser pelvis organs is the internal iliac artery. Additional sources are as follows: superior rectal artery, ovarian arteries as well as median sacral artery originating immediately from the aorta.... The internal iliac artery descends and courses along the sacroiliac joint; at the level of superior edge of the greater ischiadic foramen the artery gives off anterior and posterior trunks. From these trunks, visceral and parietal branches originate.

The main visceral branches are as follows: superior vesical arteries in the amount 2–4, uterine artery, median rectal artery and internal pudendal artery" (cit. ex Davydov et al, 1982) (1) (Fig. 1).

c. Options for surgical hemostasis in uterine hemorrhage

Surgical hemostasis to control uterine bleeding can be conservative or radical. **Conservative** methods include ligation of uterine arteries, placing compression sutures on the uterus: longitudinal and transverse B-Lynch and Pereira sutures or their combination, as well as ligation of internal iliac arteries. **Radical** methods include supravaginal or total hysterectomy. One should mention here embolization of uterine or internal iliac arteries as well as balloon occlusion of greater vessels (the aorta or iliac arteries). The latter has certain prerequisites (highly specialized tertiary care facility) which are unattainable in general obstetric practice.

In specialized literature one can find numerous descriptions of the order and techniques of conservative methods of controlling hemorrhage. Thus the 2009 ACOG standards describe an algorithm of surgical hemostasis which begins with placing compression sutures. If the effect is unsatisfactory and the patient continues bleeding, the next suggestion is to ligate uterine vessels at two levels, or to ligate internal iliac arteries (2, 7).