UTERINE ATONY: WHAT CAN BE DONE BEFORE HYSTERECTOMY?

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Postpartum haemorrhage continues to be the most important cause of maternal mortality in developing countries and in several developed ones. Between the different causes of postpartum haemorrhage, uterine atony is the most important, specially in those settings were active management of the 4th stage of labour is not performed. In the Obstetrics Service of the Institut Univaersitari Dexeus, uterine atony has been responsible for 39.7% of the 1294 cases of obstetrical haemorrhages diagnosed during its more than 60 years history1.

When facing a obstetric haemorrhage, two initial proceedings are vitally important for the patient: first to asses the severity of the blood loss, monitorize the patient and start the fluid replacement; and second to diagnose the aetiology of the bleeding and initiate the adequate steps to solve the cause of the haemorrhage. This both crucial activities should always be done quickly and in a ruled order, according to the protocols of each centre2.

Regarding the evaluation of the severity of the blood loss, as its objective evaluation is erratic and its clinical repercussion also depends on the previous haematological condition of the patient, decisions should be based on clinical findings. That is, a bleeding should be considered slight, moderate or severe according to the haemodynamic conditions as displayed in table 13.

Depending on the severity of the haemorrhage, fluid replacement should include crystalline and colloid solutions (one volume of colloid for every two of crystalloid perfused) in slight cases and whole blood or red blood cell concentrates if haemoglobin values drop below 8gr/dl in moderate bleedings and in all cases of severe haemorrhage. To assure an adequate access to the circulatory system of the patient, a second thick intravenous catheter should be placed and the administration of O2 with a mask should be started. Also a urine catheter should be placed to monitorize the urine production and the patient should be surveyed with ECG and pulsioxymetry.

Once the diagnosis of uterine atony has been made ruling out genital tract tears, uterine inversion, placental tissue retention and uterine rupture, the steps that should be considered are:

1. Uterine massage/compression as showed in picture 1 to slow down the bleeding and facilitate the uterine contraction until the uterus reacts to the pharmacological treatment
2. Stepwise administration of uterotonic drugs, starting with intravenous oxytocin, following with intramuscular Methylergometrin and as last option prostaglandine derivates as prostaglandine F2α, E2 or misoprostol. In hypertensive patients methylergometrin should be avoided, as it should be done with prostaglandins in asthmatic women. 3. Uterine tamponade using an intrauterine balloon
4. Uterine artery embolization
5. Surgical procedures: a) Progressive uterine devascularization b) Hypogastric artery ligation c) Suture of the uterine walls

Uterine massage/compression is especially advisable in case of atony accompanied of heavy bleeding during the first minutes after detachment of the placenta. The obstetrician should place a fist in the anterior vaginal vault while he presses the uterus with the other hand through the abdominal wall against it. In case of atony during a caesarean section, direct massage should be applied with both hands compressing the anterior and posterior walls against each other, while gauzes soaked in a cold solution can be placed on the uterus to further stimulate its contraction, while oxytocin is perfused thru the intravenous catheter and methylergometrin administered intramuscular.

If the previous measures fail to achieve the adequate uterine contraction, the next pharmacological agents that should be used are the prostaglandins F2α or E2. Both can be administered intramyometrally directly to the uterine horn in case of caesarean section or transabdominally in case of vaginal delivery. Repeat doses of 250µg of 15-metil PGF2α can be given every 15 a 90' up to 8 times. The perfusion of endovenous prostaglandin E2 constitutes an alternative to the intramyometrial route. In poor resource settings (developing countries) the use of oral or rectal misoprostol should be advocated, although this is an off label indication of this very cheap prostaglandin E1 analogue4.

In the last times several case reports5 have been published about the use of activated factor VII6 for the treatment of severe obstetric haemorrhages where the other medical treatments have failed to stop the haemorrhage. Although promising results have been achieved with this

therapeutic option, doubts remain regarding the optimal dosage, its security profile and the laboratory tests that could be used to monitorize its administration. At the same time its extraordinary high cost also limits its availability not only in developing countries but also in the majority of maternities of developed ones.

If the pharmacological measures fail to control the haemorrhage, the placement of an intrauterine balloon/tamponade should be considered prior to invasive surgical procedures. Although some specific intrauterine balloons are being commercialized, a Sengstaken-Blakemore or a Rusch urological hydrostatic balloon catheter can be used.

If local health resources include angiographic embolization, this option should be considered7, 8 before deciding to perform a laparotomy. As the patient must be transferred to the angiography suite and it takes some time to join together the staff, this option is not always feasible, especially if the bleeding is acute or the patient is in bad hemodynamic status.

Despite the development of medical, obstetrical and arterial embolization techniques to control acute postpartum haemorrhage, surgical procedures should be known by consultant obstetricians as they may be the ultimate option in order not only to save the mother's live, but also her fertility. Conservative techniques consist of arterial ligations and uterine compression, while the radical option is the hysterectomy.

Regarding vascular ligations, the stepwise uterine devascularization that entails five successive steps, has been proposed9. The steps were (1) unilateral uterine vessel ligation, (2) bilateral uterine vessel ligation, (3) low uterine vessel ligation, (4) unilateral ovarian vessel ligation and (5) bilateral ovarian vessel ligation. The other alternative consists in the ligation of the hypogastric arteries10.

As an alternative to the vascular ligations in patients with haemorrhage caused by uterine atony, special brace sutures described by B. Lynch have been successfully used in several cases11.

As the last resort a total or subtotal hysterectomy should be done.

TABLE 1

Severity	Findings	Blood loss
Slight	HR<100 beats/min	900-1800ml (15-30%)
	Moderate Hypotension	
	Peripheral Vasoconstriction	
Moderate HR:	100-140 beats/min	1800-2400ml (30-40%)
	SBP: 80-100 mmHg	
	Inquietud, oliguria	
Severe	HR >140 beats/min	>2400ml (>40%)
	SBP <60 mmHg	
	Confusion / lethargy	
	anuria (<5ml/h)	

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