
Intraoperative error in estimation of blood loss due to change in the size of abdominal swab

Sir,

Surgeries are associated with blood loss which can be moderate to severe. Loss of blood in the intraoperative period is of concern to both the surgeon and the anaesthesiologist. Accurate assessment of blood loss is necessary as underestimation can lead to delayed replacement which results in hypoperfusion, decreased haemoglobin, delayed recovery, and increased morbidity and mortality.^[1] Overestimation of blood loss can lead to unnecessary transfusion, volume overload, and cardiac failure.

We present a case of a 70-year-old female patient weighing 50 kg suffering from carcinoma of the endometrium undergoing staging exploratory laparotomy. The patient was accepted under American Society of Anesthesiologists' physical status class-II with a haemoglobin level of 10 g/dl. Maximum allowable blood loss (MABL) calculated

was 550 ml. General anaesthesia (GA) along with epidural analgesia was administered. No epidural drug was given except the test dose which was negative. Intraoperatively, the patient had an episode of hypotension as blood pressure dropped from 130/70 mmHg to 85/54 mmHg with heart rate increasing from the basal value of 78 beats/min to 118 beats/min. Blood transfusion was started, and the blood loss estimated by the anaesthesia resident was 518 ml (fully soaked six abdominal swabs and



Figure 1: The discrepancy in the size of the two abdominal swabs

Table 1: Comparison between the two abdominal swabs

Abdominal swab	Small (S)	Large (L)
Size	21 × 20 cm	21 × 32 cm
Dry weight in g	7g	17 g
Fully soaked with blood (ml)*	53 ml	103 ml
Thickness of swab (ply)#	6 ply	6 ply

*1 g of water weighs 1 ml in volume. Therefore, the swabs were weighed after soaking it in normal saline and weighed 56 g and 109 g, respectively. The density of normal saline (NS) is 1.004 and blood is 1.060. Therefore, we used the following formula to calculate the approximate volume expressed in ml: Density of NS/Density of blood) × 56=53 ml and Density of NS/Density of blood) × 109=103 ml. #Ply is how many yarns are twisted together to make a single thread

200 ml in suction). Despite adequate blood and fluid resuscitation and control of bleeding at the surgical site, blood pressure continued to be on the lower side (88/45 mmHg) at this juncture; other causes of intraoperative hypotension such as sudden change in position of the patient, perioperative cardiac event, and anaphylaxis to the drugs were ruled out. Arterial blood gas analysis indicated cellular hypoperfusion with metabolic acidosis (pH of 7.28) with lactate of more than 2 mmol/L and haemoglobin of 7 g/dl. This raised the doubt of discrepancy in estimation. On reassessment of the field of surgery, suction, and abdominal swabs, it was noticed that abdominal swabs were larger in size (21 × 32 cm) than those routinely being used previously (21 × 20 cm) [Table 1]. On re-estimation, the calculated blood loss was 818 ml. Corrective action was taken and deficit blood was transfused following which the patient became haemodynamically stable.

Intraoperative estimation of blood loss is a continuous process which involves assessment and calculations based on the type of surgery, blood collected in suctions, soaked abdominal swabs, and gauze pieces. Precise calculation of blood loss and replacement of blood and blood products is important as hypoperfusion leads to decreased capillary filling, and acidosis which further lead to decreased delivery of oxygen to tissues, resulting in delay in achieving the goals of cellular resuscitation, and increased morbidity and mortality.^[1,2] There are various methods mentioned in the literature to measure blood loss which include visual estimation, photometry, colorimetric and gravimetric method and the use of radiolabeled red blood cells (RBC).^[3,4] Pitfalls exist with the visual method of blood loss estimation as interobserver variation is likely to effect the true calculation, and therefore, it can only be used in conjunction with one of the direct methods described above.^[5] In our

institute, we use the weight method for assessing blood loss. Weighing surgical sponges, laparotomy pads, and gauze pads, and measuring drainage containers are the most commonly employed direct methods for blood loss estimation. The abdominal swab used in our case, was found to be larger in size [Figure 1], and twice the weight when fully soaked, compared to the usual swabs [Table 1]. To prevent such errors in calculating intraoperative blood loss, it is recommended to always use a standardized size of abdominal swabs, and if there is any change in size, then it should be notified to the anaesthesiologists by nursing staff, as any change will lead to discrepancy in blood loss estimation which can prove fatal not only in a healthy patient but also in pediatric and geriatric patients who have limited cardiopulmonary reserves.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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