

BLADDER INFLATION “BEFORE” CESAREAN SECTION: WHY BEFORE?

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Abbreviations: CS: cesarean section, PAS: placenta accreta spectrum

Dear Editor,

I commend Naseeb and colleagues (2023) for providing an important data: In cesarean section (CS) for high-risk patients, bladder injury significantly less often occurred in patients with bladder inflation than those without. Bladder inflation may reduce the incidence of bladder injury at CS. I wish to ask the authors why the bladder should be inflated “before” CS. I believe that the bladder should be inflated “after” entering the abdominal cavity “before the bladder separation”, and not before surgery. I have some clarifications. First, bladder inflation prevents bladder injury at the time of bladder separation, and thus it should be performed before bladder separation. To my knowledge, our team was the first to report that bladder inflation (referred to as “filling the bladder” technique) prevents bladder injury at cesarean hysterectomy for placenta accreta spectrum (PAS) (Matsubara et al., 2013).

Although we studied patients with PAS (Matsubara et al., 2013), bladder inflation can prevent bladder injury when we perform bladder separation. Figures 1 a versus b illustrate the situation. In patients with previous obstetric and/or gynecologic surgeries, especially CS, the vesicouterine fold becomes thick, and thus, the bladder cephalad end (bladder separation start-point) becomes obscure. Bladder separation may start from too caudal (arrow in Figure 1a) or cephalad (double arrow in Figure 1a). The former is more likely to cause bladder injury, whereas the latter often causes bleeding. With bladder inflation, the bladder-separation point becomes evident. We can grasp “from where we should start bladder separation” (arrow in Figure 1b). This prevents bladder injury (Matsubara, et al., 2013; Matsubara, 2018). We sometimes employ the following modifications. Before bladder separation, we inflate the bladder to

recognize the bladder top (bladder separation start-point), then deflate the bladder, and start bladder separation from this point. Whether the bladder should remain inflated during separation depends on the situation or doctors’ preference. Regardless, the fundamental concept of bladder inflation is to reduce bladder injury at the time of bladder separation (Matsubara, et al., 2013; Matsubara, 2018).

Second, bladder inflation “before CS” may increase bladder injury during abdominal entry. Figure 1 c versus d illustrates the situation. After pelvic surgery, the bladder sometimes adheres to the abdominal wall. Making the matter worse, the bladder top is pulled up to the cephalad. Due to bladder inflation “before CS”, the bladder top may be extended much more cephalad (comparison between X and Y of Figure 1c and d). I am concerned that, with bladder inflation, less-experienced doctors are more likely to injure the bladder just at the time of entering the abdominal cavity.

I admit that there may be some fortunate situations. At abdominal opening, “water filling” (especially when some dye is added to the inflating water) may make the bladder seen through. This may cause a surgeon recognize the presence of the bladder just beneath the site to be incised, preventing bladder injury. However, we may rarely encounter such a fortunate case. One option for utilizing “inflation before CS” is: just before skin incision, ultrasound should be used to confirm the site of bladder top. This may prevent an extreme situation: the first cut injures the bladder.

Based on my 4.5 decades of obstetric practice, bladder inflation, or filling the bladder technique, is undoubtedly useful to prevent bladder injury. This is because we can directly look at, and thus grasp, the bladder morphology “during” the surgery. No need to inflate “before surgery”. I wish to know whether inflation before CS prevented bladder injury at the time of abdominal entry. I wish to know the fundamental policy of Naseeb and colleagues.

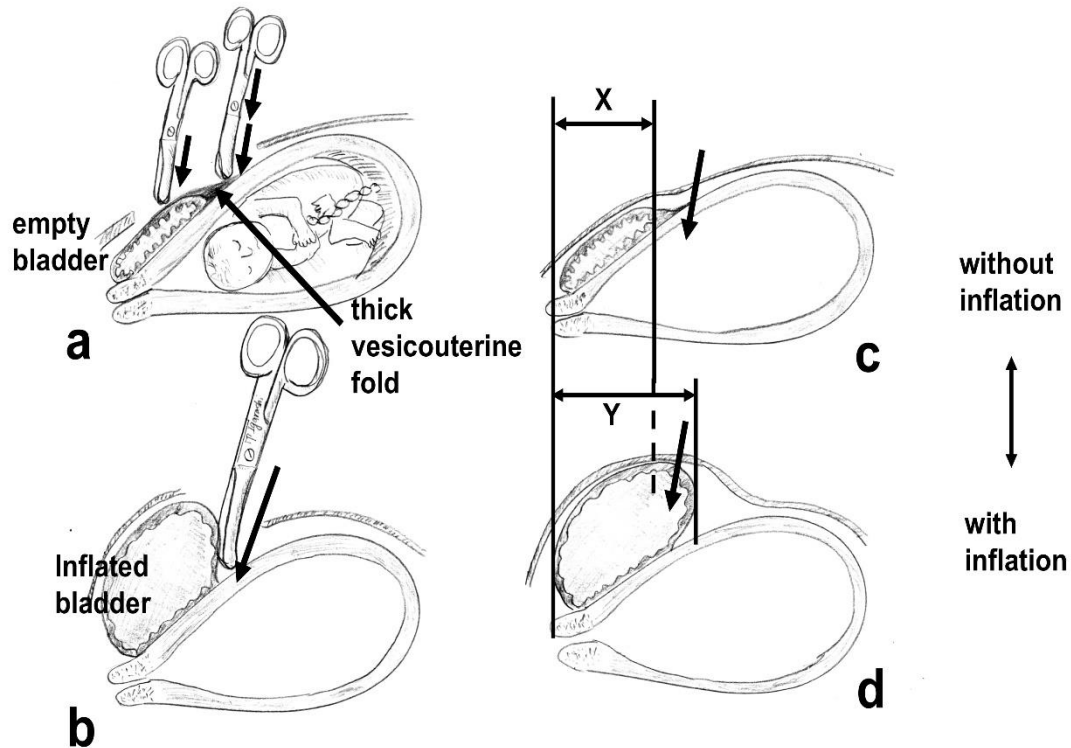


Figure 1

Figure 1. Schematic presentation of the morphology of the bladder and its surrounding structures without (a and c) versus with (b and d) bladder inflation.

- Without bladder inflation. In patients with a history of pelvic surgeries, especially cesarean section, the vesicouterine fold becomes thick and thus obscure (long arrow). One may start bladder separation from too caudal (arrow) or too cephalad (double arrow). Both cause some troubles (see text).
- With bladder inflation. The cephalad end (bladder top) becomes evident, from which one can start bladder separation (arrow).
- Without bladder inflation.
- With bladder inflation. Compared without inflation (c), in bladder inflation, the bladder occupies the larger area in the abdominal-pelvic cavity beneath the abdominal wall ($X < Y$). Arrow (c and d) indicates the abdominal incision point. See that just beneath the incision point (arrow), the bladder is absent (c) or present (d). This depends on how much water (or urine) is present in the bladder or individual bladder morphology; however, bladder injury is more likely to occur with inflation (d) at the time of entering the abdominal cavity (see text).

Declaration

Conflict of interest statement

The author has no conflict of interest regarding this study.

Approval of Institutional Review Board

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Patient anonymity

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Informed consent

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I previously reported the filling bladder technique, which was cited appropriately.

Author contribution

Shigeki Matsubara identified the significance and wrote the manuscript.

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