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## Case Report

### Treatment of acute postpartum uterine inversion case with a different compression suture technique

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## ABSTRACT

Uterine inversion is a very rare cause of postpartum hemorrhage that can be fatal for the patient. Primary treatment is the reduction of a collapsed uterus fundus. In this case, we have used Johnson maneuver to correct the collapsed fundus. But we failed. When this rare condition is encountered, an alternative treatment should always be available. We used compression suture that uterine atony and placental adhesion anomalies are used very often. The patient's bleeding was stopped. The uterus was prevented from collapsing again.

**KEY WORDS:** atony, compression suture, postpartum hemorrhage, uterine inversion

## INTRODUCTION

Uterine inversion is the disruption of the uterine fundus into the endometrial cavity. In many times, uterine tubes are accompanied additionally. In very severe cases, the uterus is evident from the vaginal opening through the endometrial surface. Incidence is 3737 births<sup>[1]</sup>. The maternal mortality due to uterine inversion was reported as high as 15% in the old series in the literature<sup>[2]</sup>. The most important risk factor is uncontrolled traction applied to the cord<sup>[3]</sup>. Therapeutic models such as correction of manual uterine inversion and surgical fixation are available. Johnson maneuver is applied for manual correction. Surgical correction is performed in advanced inversion cases<sup>[4]</sup>. Risk of bleeding and early inversion relapse always continues in inversion cases. In these cases, compression sutures which are frequently used in uterine atony and placental adhesion anomalies can be used<sup>[5]</sup>. So we used a different compression suture technique to prevent early recurrence of acute postpartum uterine inversion.

## CASE REPORT

A 34-year-old woman delivered in our clinic. At birth, the placenta was taken by the midwife. It was stated that, the placenta was subjected to traction. With the release of the placenta, it was said that there was an explosion type bleeding. When abdominal examination was performed for fundal massage, the uterine peak was not palpable. Hemorrhagic fragile tissue at the top of the vagina was seen when vaginal examination. The patient who was diagnosed with third degree uterine inversion was decided to reposition the inverted uterine part with Johnson maneuver. Uterotonic agents were cut off before maneuver. Nifedipine was administered at a dose of 20 mg in total at a sublingual repeat dose of 10 mg. The uterine inversion could not be corrected with the pharmacological agent applied and manual thrust. The patient was sedated with the general anesthetic agent Propofol. The maneuver was applied again but manual correction was not successful after general anesthetic agent. There was a blood loss of about 2500 ml. Blood pressure was arterial 60/40 mmHg, pulse was 136 atm/min. A complete blood count was made. Hemoglobin was 5.9 mg/dl, hematocrit was 19%, plt was 156x10<sup>3</sup>/ml, fibrinogen was 210 mg/dl. The emergency laparotomy was made because the patient's clinic worsened very rapidly. In the exploration, a portion of the tubal uterine, utero ovarian ligament, and round ligament together with the uterine fundus were inverted as shown in Figure 1.

The inverted uterine structures were tried to be corrected by stroking from the isthmus zone. Huntington's procedure was applied when there was no improvement with stroking. Inverted portions were held with two ring forceps, and a stepwise slow traction was applied and corrected as shown in Figure 2. After correction, there was widespread muscle tonus loss in all uterine segments. Oxytocin 10 IU was administered intravenously 10 IU/2 mL. 30 IU oxytocin was infused in 500 cc isotonic, methylergonovine maleat 0.2 mg/ml intramuscular two doses with 15 minutes intervals and Misoprostol 800 µgr rectal was applied. No uterine muscle tone developed despite uterotonic cure. Hysterectomy was planned but the treatment alternatives for the uterus protective surgery approach were considered because the patient's partner insisted on the need for fertility protection. Severe atonia of the uterus was a major risk for recurrence of bleeding and acute inversion. We performed compression suture to prevent both uterine atony and acute puerperal inversion recurrence. Hemorrhage stopped after suture and the uterus fundus did not collapse again Figure 3. The schematic drawing of the compression suture applied to the patient is shown in Figure 4. No uterine artery or hypogastric artery ligation was required. Acute necrosis was not observed. Intraoperative total 4 units of erythrocyte suspension and 4 units of fresh frozen plasma were infused. Preop hematocrit and hemoglobin were 35% and 11.9 mg/dl respectively and after transfusion hematocrit, hemoglobin and platelet was 26%, 8.3 mg/dl, 133000/ml respectively. The patient was followed up for 1 day in intensive care unit. Because of the risk of uterine necrosis, abdominal pain, systemic fever, white blood cell count and C-reactive protein follow up were performed. There were no signs of uterine necrosis. On the third postoperative day, ultrasonographic examination was performed. Uterine involution was found to be consistent with postpartum third day Figure 5. Uterine artery color doppler ultrasonography showed normal blood flow Figure 6. The patient was discharged by healing on postoperative 5<sup>th</sup> day.

## DISCUSSION

Several treatment modalities have been applied in the treatment of uterine inversion. Choosing the treatment that the surgeon has the fastest and most experience in choosing which treatment to treat will reduce patient mortality<sup>[6]</sup>. Marshall *et al* reported that the patient had cardiac arrest 9 minutes after birth due to massive bleeding during an inversion<sup>[7]</sup>. Ihama *et al* reported that the patient died 15 minutes after the birth of the baby<sup>[8]</sup>. In non-surgical treatment, bakri postpartum balloon can also be used. In the literature, there is a bakri balloon application after inversion correction. Ida *et al* applied a bakri balloon to control recurrence and bleeding after correction of uterine inversion, and they achieved treatment success<sup>[9]</sup>.

The bakri ballone can be applied in cases where the inversion degree is as low as 1-2 and the uterus can be easily reduced. In cases where the inversion can not be corrected, the bakri balloon can not be used<sup>[10]</sup>. In our case with massive hemorrhage, we had to make a very quick decision at each step, so the laparotomy decision was made when manual correction did not response. A surgical procedure includes preserving of uterus or removal of uterus<sup>[5]</sup>. We applied a compression suture as a uterine conservative treatment model.

Compression sutures are surgical procedures applied to protect the uterus in cases of uterine atony and placenta accreta<sup>[11,12]</sup>. Matsubara *et al* performed compression sutures to prevent acute recurrence at the time of uterine inversion and they were successful. The compression suture technique they use is MY (matsubara-yano) technique. Five suture nodes were attached in this compression suture and the uterus was perforated ten times<sup>[13]</sup>. We used a different technique as compression suture in our case. We had fewer knots and fewer uterine perforations. We applied four sutures and the uterus drilled eight times. In addition, in the technique we applied, the compressed uterine tissue became "S" shaped. Necrosis-protective tissue was maintained (Figure 6). It is necessary to act in proportion to the compressive sutures and vein connections of the uterus. Too much thrown sutures may disrupt uterine blood supply, resulting in uterine necrosis. Cho type uterus compression sutures were applied at postpartum hemorrhage resulting from uterine atony by Benkiranea *et al*. On the third postoperative day, uterine necrosis findings starting with abdominal pain and fever were detected in the patient. The patient had developed sepsis. The necrotized uterus was removed by hysterectomy with relaparotomy<sup>[14]</sup>. In addition, increased compression suture number increases the risk of formation of the uterin synechias. Ibrahim *et al* reported that the applied compression suture increased the risk of intrauterine synechias<sup>[15]</sup>. Laparotomy should not be avoided in advanced (grade 3-4) uterine inversions since reduction is difficult. Compression sutures should be remembered in cases of laparotomy and uterus-preserving approaches. Compression sutures prevent acute recurrence of the inversion, as well as uterine atony. The compression suture type to be applied depends on the uterine inversion (atonia / placenta accreta) reason and the experience of the surgeon. The aim is to stop the bleeding with lesser tissue compression and uterus puncture. Compression suture application in uterine inversion cases is available in the literature in a limited number.

## CONCLUSION

Compression suture technique in the presented case prevented acute inversion relapse and complication was not occurred. A greater number of cases or case series are needed to determine the efficacy of this treatment.

## ACKNOWLEDGMENT

The authors declare no conflicts of interest.

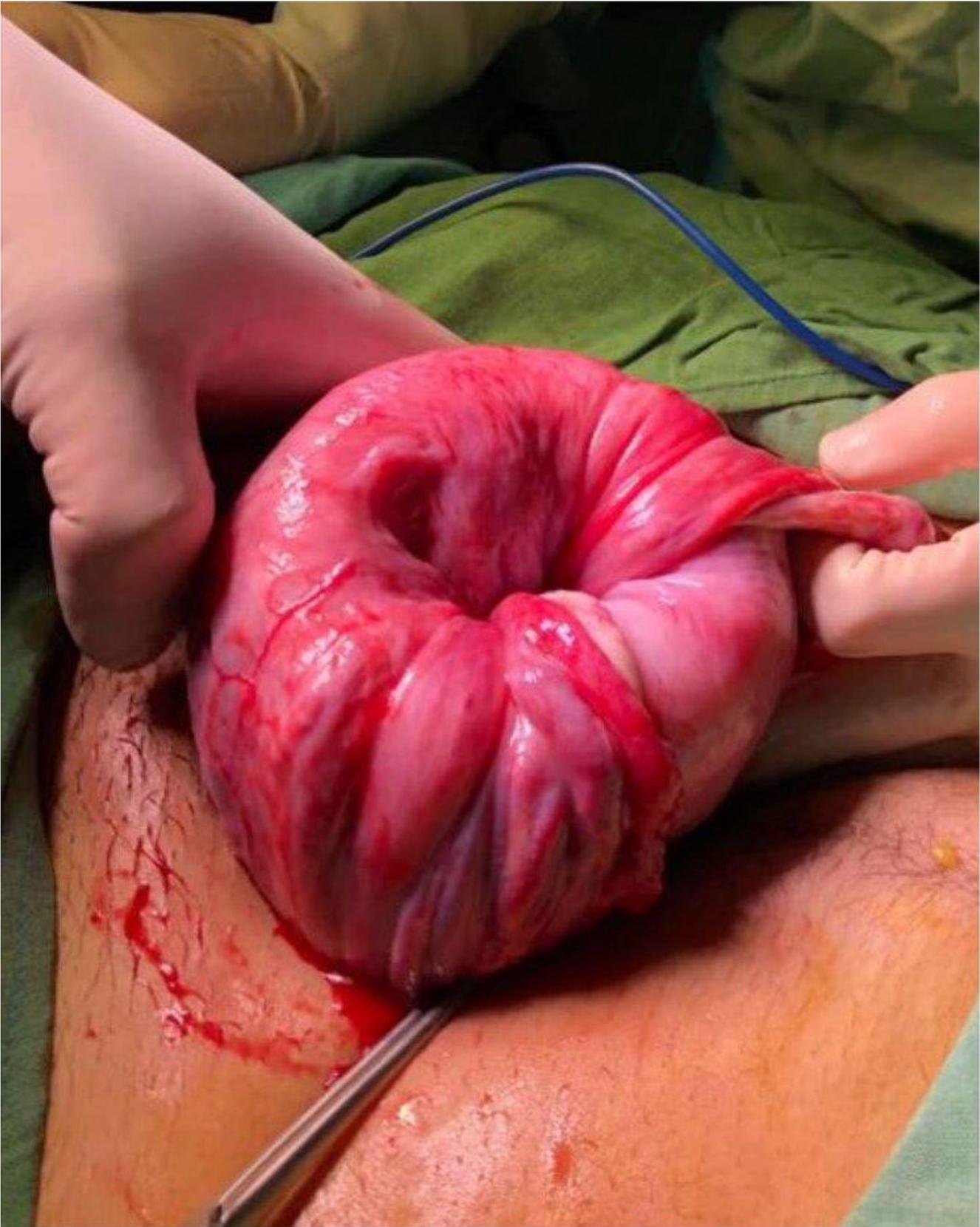
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Mehmet Bülbül; Manuscript design

**REFERENCES**

1. Baskett TF. Acute Uterine Inversion: A Review of 40 Cases. *J Obstet Gynaecol Canada*. 2002;24(12):953–6.
2. Obstetrician T. Review Acute inversion of the uterus Learning objectives : Ethical issues : World Health. 2009;13–8.
3. Witteveen T, Stralen G, Zwart J, Roosmalen J. Puerperal uterine inversion in the Netherlands: a nationwide cohort study. *Acta Obstet Gynecol Scand*. 92(3):334–7.
4. Catanzarite VA, Moffitt KD, Baker ML, Awadalla SG, Argubright KF, Perkins RP. New approaches to the management of acute puerperal uterine inversion. *Obstet Gynecol*. 1986;68(3 Suppl):7S—10S.
5. Coad SL, Dahlgren LS, Hutcheon JA. Risks and consequences of puerperal uterine inversion in the United States, 2004 through 2013. *Am J Obstet Gynecol*. 2017 Sep 1;217(3):377.e1-377.e6.
6. Senanayake H, Ranaweera P, Rishard M. Acute puerperal uterine inversion. *Obstet Intrapartum Emergencies A Pract Guid to Manag*. 2012;120–5.
7. Marshall NB, Catling S. Cardiac arrest due to uterine inversion during caesarean section. *Int J Obstet Anesth*. 2010 Apr 1;19(2):231–4.
8. Ihama Y, Fukasawa M, Ninomiya K, Miyazaki T. Acute puerperal uterine inversion. *Forensic Sci Med Pathol* (2014) 10:272–274.
9. Ida A, Ito K, Kubota Y, Nosaka M, Kato H, Tsuji Y. Successful Reduction of Acute Puerperal Uterine Inversion with the Use of a Bakri Postpartum Balloon. *Case Rep Obstet Gynecol*. 2015;2015:1–5.
10. Kaya B, Tüten A, Çelik H, Misirlioğlu M, Ünal O. Non-invasive management of acute recurrent puerperal uterine inversion with Bakri postpartum balloon. *Arch Gynecol Obstet*. 2014;289(3):695–6.
11. B-Lynch C, Coker A, Lawal AH, Abu J, Cowen MJ. The B-Lynch surgical technique for the control of massive postpartum haemorrhage: an alternative to hysterectomy? Five cases reported. *BJOG An Int J Obstet Gynaecol*. 104(3):372–5.
12. Cho JH, Jun HS, Lee CN. Hemostatic suturing technique for uterine bleeding during cesarean delivery. *Obstet Gynecol*. 2000;96(1):129–31.
13. Matsubara S, Yano H, Taneichi A, Suzuki M. Uterine compression suture against impending recurrence of uterine inversion immediately after laparotomy repositioning. *J Obstet Gynaecol Res*. 35(4):819–23.
14. Benkirane S, Saadi H, Serji B, Mimouni A. Uterine necrosis following a combination of uterine compression sutures and vascular ligation during a postpartum hemorrhage: A case report. *Int J Surg Case Rep*. 2017 Jul 10;38:5–7.
15. Ibrahim MI, Raafat TA, Ellaithy MI, Aly RT. Risk of postpartum uterine synechiae following uterine compression suturing during postpartum haemorrhage. *Aust New Zeal J Obstet Gynaecol*. 53(1):37–45.



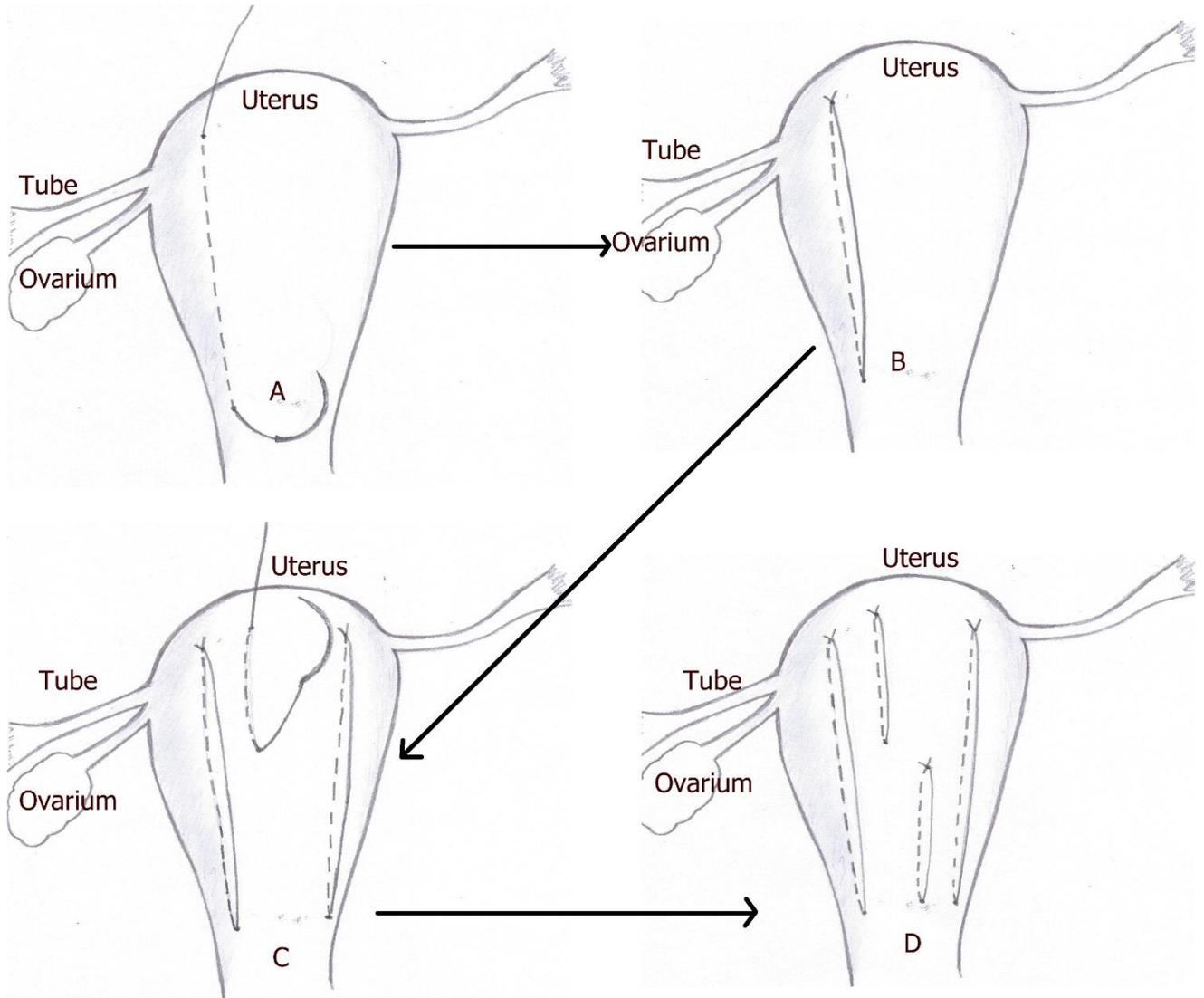
**Figure 1:** When abdominal exploration also showed collapse in tubal uterine, ovaries and round ligaments with uterine fundus.



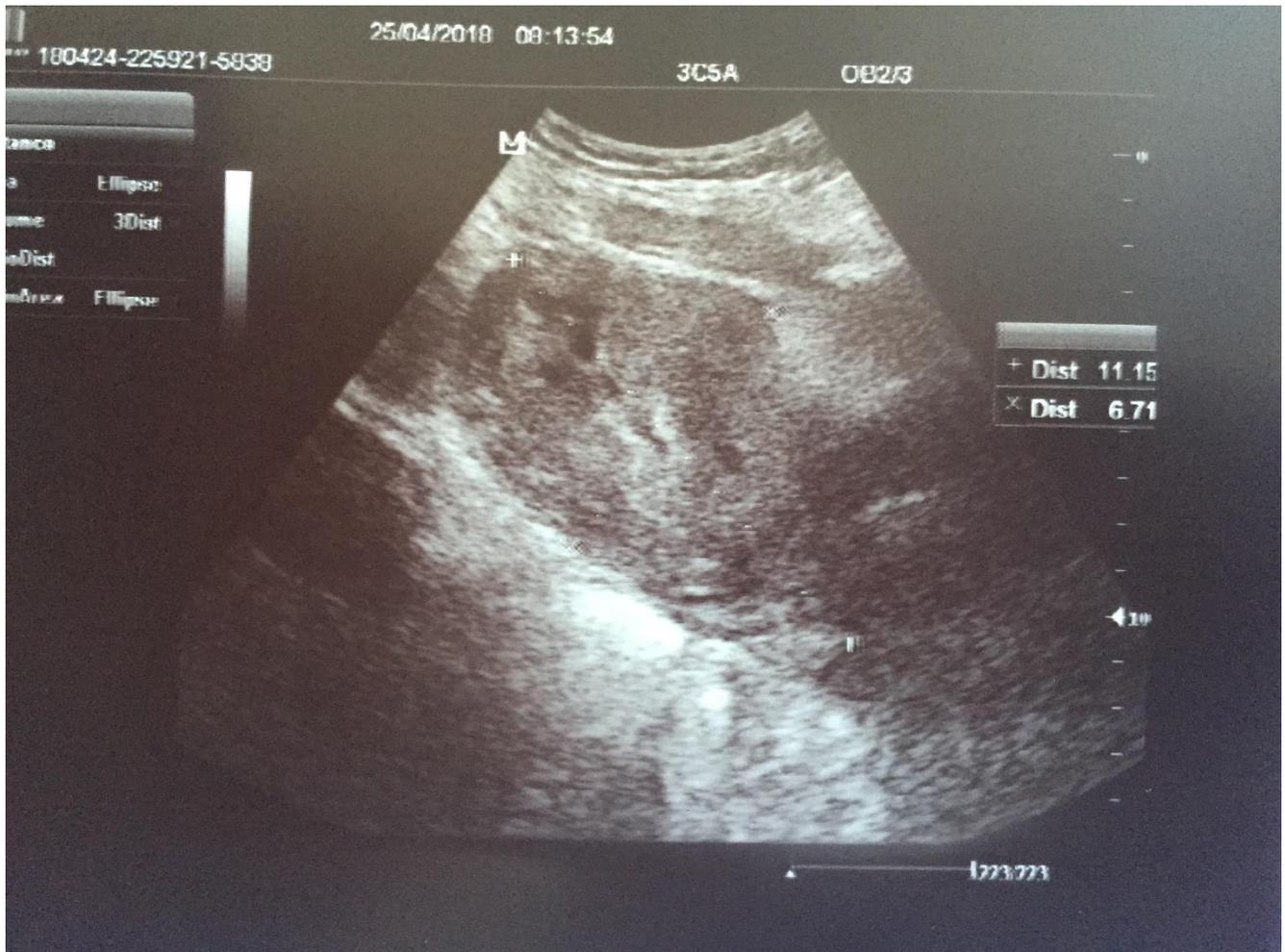
**Figure 2:** The part of collapsed of uterine fundus were kept with two ring forceps, were subjected to slow and gradual traction; It was corrected by the Huntington procedure as shown in Figure 2. Total tonus loss was in the uterus



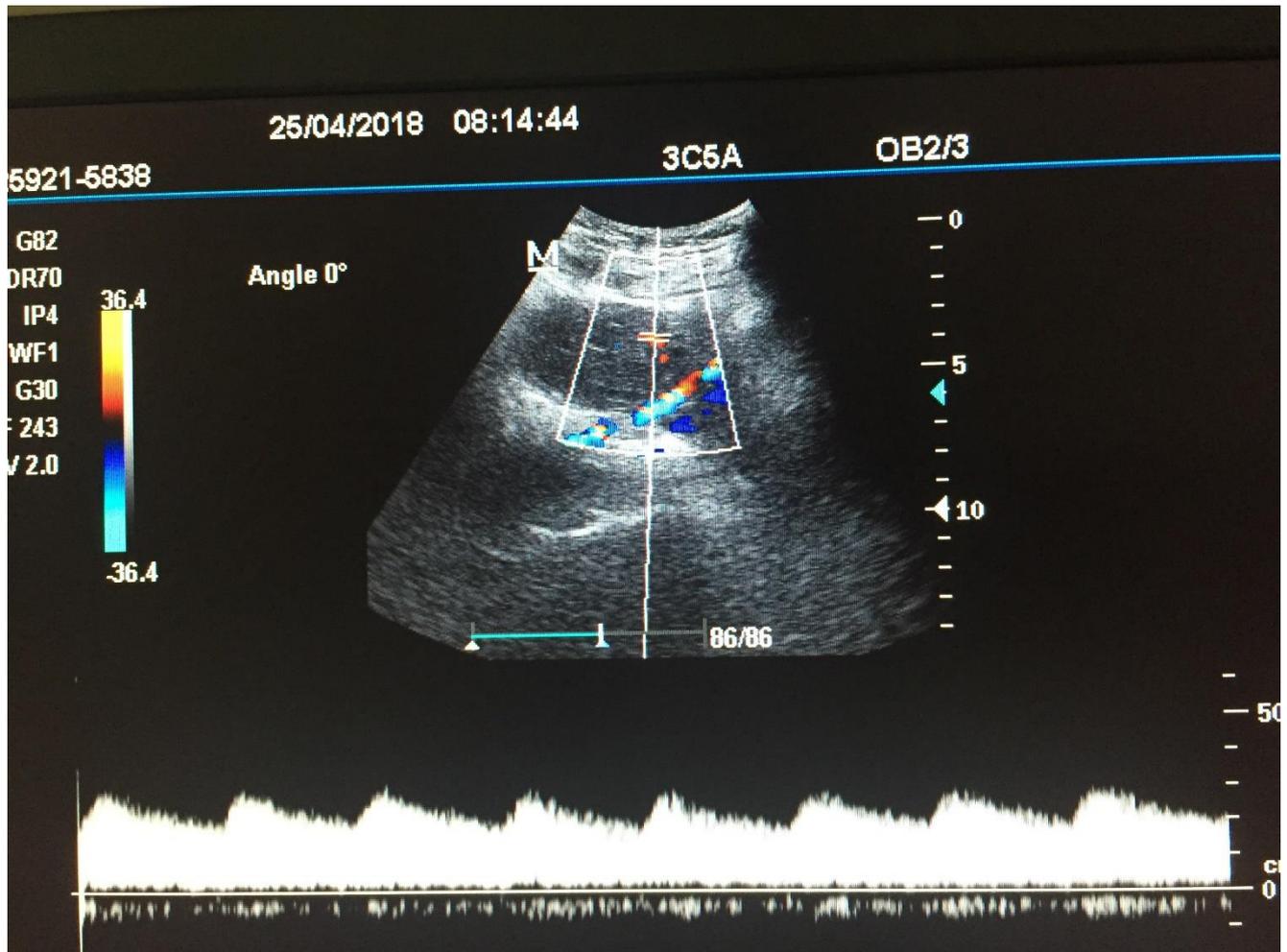
**Figure 3:** Hayman-like suture was performed both side to the uterus, and two short suture performed between to the this long suture on both side of the uterus. In the technique we applied, the compressed uterine tissue became " S "shaped. Necrosis protective tissue continuity was occur with this suture technique.



**Figure 4:** In the applied compression suture, the uterus was perforated eight times and ligated four knots. 1-0 vicryl was used at the compression suture.



**Figure 5:** Uterine involution was found to be consistent with postpartum third day. Uterine necrosis was not detected.



**Figure 6:** Uterine artery color doppler ultrasonography showed normal blood flow in third day.