

Clinical complications after transvaginal oocyte retrieval in 7,098 IVF cycles

We report the complications observed after transvaginal oocyte retrieval guided by ultrasound in 7,098 IVF cycles. The frequency of severe complications in our patients was 0.08%, of which four cases were intraperitoneal bleeding (0.06%) and two were cases of ovarian abscess (0.003%). (Fertil Steril® 2011;95:293–4. ©2011 by American Society for Reproductive Medicine.)

Key Words: Transvaginal oocyte retrieval, peritoneal bleeding, pelvic abscess, IVF cycle

To harvest oocytes from ovarian follicles in in vitro fertilization (IVF) cycles, retrieval by the transvaginal route under ultrasound guidance is used worldwide. This technique is easy to learn and to perform, and consequently since 1985 it has replaced laparoscopic oocyte retrieval (1, 2). However, the technique may present some complications, which may even be life threatening, although rare, as reported occasionally in the literature in several case reports. Those papers have reported the occurrence of peritoneal bleeding (3–6), pelvic sepsis or ovarian abscess (4, 7, 8), ureterovaginal fistulas (9, 10), pseudoaneurysm of the iliac artery (11), and so on. All of these adverse events are iatrogenic, due to the traumatic damage of the needle used for transvaginal retrieval. In the literature, there is a lack of data on their incidence, and the few papers reporting their frequency show substantial differences in the numbers (4, 7, 12–16).

The aim of the present study was to report our experience concerning the complications of transvaginal oocyte retrieval in >7,000 cases performed in our IVF center.

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between January 1987 and December 2009, 7,098 transvaginal oocyte retrievals (TVOR) guided by ultrasound were performed.

All patients, after the oocyte retrieval procedure, underwent a routine transvaginal ultrasound pelvic scan before being discharged from the unit, ~4 hours after the procedure. In addition, all patients received prophylactic antibiotic therapy: 1 g ceftazidime intravenously administered immediately after sedation.

In our series of 7,098 transvaginal oocyte retrievals, we observed in four patients severe peritoneal bleeding requiring surgical treatment (0.06%, 95% confidence interval [CI] 0.00–0.12), and in two patients pelvic abscesses (0.03%, 95% CI 0.00–0.07), for a total of six cases of severe clinical complications (0.08%, 95% CI 0.03–0.18).

In the cases of peritoneal bleeding, the patients showed hemodynamic instability and abdominal pain. Ultrasound pelvic scans showed the presence of free fluid in the peritoneum at a volume >200 mL, considered to be normal according to the literature (17–19). In two cases the bleeding was observed 2 hours after oocyte retrieval, whereas in the other two cases the clinical signs of peritoneal bleeding were reported 12 hours after oocyte retrieval.

In the first case, the patient, who underwent oocyte retrieval in a natural cycle, showed severe pain and low blood pressure 2 hours after the procedure. The woman underwent laparoscopy, 750 mL of blood was aspirated from the peritoneal cavity, the bleeding site was identified on the left ovary, the follicle was aspirated, and the bleeding was coagulated with bipolar coagulation forceps. One embryo was transferred 3 days after the laparoscopic procedure, but no pregnancy resulted.

In the second case, the patient underwent oocyte retrieval after controlled ovarian stimulation performed with a standard long protocol; the symptoms of pelvic bleeding occurred 2 hours after the procedure. The patient underwent laparoscopy, 850 mL of blood was aspirated, and hemostasis was achieved on the right ovary in one of the aspirated follicles with bipolar coagulation forceps. Three days after the surgery, the patient had 2 embryos transferred, but no pregnancy resulted.

In the third case, the symptoms occurred 12 hours after oocyte retrieval, with abdominal pain and low blood pressure. At laparoscopy, 1,000 mL blood was drained. Due to the difficulties

encountered to stop the bleeding in the left ovary, a wedge resection was performed and haemostasis accomplished. Embryo transfer was not performed, and the embryos were cryopreserved.

In the fourth case, 12 hours after oocyte retrieval the patient showed signs of circulatory instability and underwent laparoscopic surgery for intraperitoneal bleeding; 950 mL of blood was aspirated. The bleeding site was found on the left ovary and was coagulated. Two blastocysts were transferred 5 days later, and a successful pregnancy occurred.

In the first case of pelvic abscess, the woman came to our notice 1 week after embryo transfer with fever and pelvic pain; a pelvic abscess was diagnosed by ultrasound scan on the left ovary, which was surgically treated with oophorectomy.

In the second case, the pelvic abscess was observed in a woman who had undergone oocyte retrieval 10 days earlier: she had fever and pelvic pain, and a pelvic abscess on the right ovary was surgically drained.

The frequency of post-oocyte retrieval bleeding is reported in the literature with different figures depending on the authors: The few studies conducted to determine its incidence have shown rates ranging from 1.3% to as low as 0.09% (4, 7, 12–15), whereas the most recent reports showed a frequency for abdominal bleeding of 0.34% in a series of 4,052 cases (16). We observed a frequency of 0.06%, lower than previously reported in other reports. Several clinical factors may be associated with this complication, such as factor IX deficiency, ovarian necrotizing vasculitis, and anticoagulant treatment (3, 6, 20). Despite the fact that sometimes the bleeding spontaneously stops, surgical treatment by laparoscopy or laparotomy is needed in the case of heavy bleeding.

The present paper reports the incidence of oocyte retrieval complications in a very large group of cases (the biggest reported in the literature to our knowledge). The bleeding complications, in our cases, were observed not only immediately after the procedure but also after ≥ 12 hours, when the women were discharged from the clinic. This may be due to a slight bleeding that requires more time to show clinical signs, or to bleeding of the corpus luteum which develops after follicle retrieval and that might start to bleed after its formation, such as may happen in normal menstrual cycles (21). Two studies have been published, by Dessole et al. (18) and Ragni et al. (19), regarding the amount of blood loss that can be considered to be normal during this procedure and the amount of free fluid in the abdomen in women after undergoing TVOR without complications, evaluated not to exceed 200 mL by ultrasound evaluation.

Regarding pelvic abscess, even though it is less frequent than bleeding, it is a complication that may happen after transvaginal retrieval despite antibiotic prophylaxis, as in our cases. Furthermore, in all patients before starting stimulation, a culture for vaginal infections was performed and had to be negative to proceed. The presence of pelvic adhesions may be associated with pelvic infections after TVOR (4, 8). The incidence of pelvic infections after TVOR is not well known, even though a frequency as high as 0.24% has been reported in a series of 2,495 cases (4), whereas in our experience it was much lower, only 0.03%.

Patients should be aware of the risks of the oocyte retrieval procedure, and physicians should give them correct information on the incidence of these complications, which should be reported on the written informed consent that the woman has to sign before undergoing the procedure.

REFERENCES

- Schulman JD, Dorfmann A, Jones S, Joyce B, Hanser J. Outpatient in vitro fertilization using transvaginal oocyte retrieval and local anesthesia. *N Engl J Med* 1985;312:1639.
- Dellenbach P, Nisand I, Moreau L, Feger B, Plumere C, Gerlinger P. Transvaginal sonographically controlled follicle puncture for oocyte retrieval. *Fertil Steril* 1985;44:656–62.
- Ilbery M, Lyons B, Sundaresan V. Ovarian necrotizing vasculitis causing major intra-abdominal haemorrhage after IVF. Case report and literature review. *Br J Obstet Gynaecol* 1991;98:596–9.
- Roest J, Mous HV, Zeilmaker GH, Verhoeff A. The incidence of major clinical complications in a Dutch transport IVF programme. *Hum Reprod Update* 1996;2:345–53.
- Moayeri SE, Coutre SE, Ramirez EJ, Westphal LM. Von Willebrand disease presenting as recurrent hemorrhage after transvaginal oocyte retrieval. *Am J Obstet Gynecol* 2007;196:e10–1.
- Azem F, Wolf Y, Botchan A, Amit A, Lessing JB, Kluger Y. Massive retroperitoneal bleeding: a complication of transvaginal ultrasonography-guided oocyte retrieval for in vitro fertilization-embryo transfer. *Fertil Steril* 2000;74:405–6.
- Tureck RW, García CR, Blasco L, Mastroianni L Jr. Perioperative complications arising after transvaginal oocyte retrieval. *Obstet Gynecol* 1993;81:590–3.
- Sharpe K, Karovitch AJ, Claman P, Suh KN. Transvaginal oocyte retrieval for in vitro fertilization complicated by ovarian abscess during pregnancy. *Fertil Steril* 2006;86:219.e11–3.
- von Eye Corleta H, Moretto M, d'Avila AM, Berger M. Immediate ureterovaginal fistula secondary to oocyte retrieval—a case report. *Fertil Steril* 2008;90:2006.e1–3.
- Cahill DJ, Fox R, Wardle PG. Ureteral obstruction—a complication of oocyte retrieval. *Fertil Steril* 1994;61:787–8.
- Bozdag G, Basaran A, Cil B, Esinler I, Yarali H. An oocyte pick-up procedure complicated with pseudoaneurysm of the internal iliac artery. *Fertil Steril* 2008;90:2004.e11–3.
- Dicker D, Ashkenazi J, Feldberg D, Levy T, Dekel A, Ben-Rafael Z. Severe abdominal complications after transvaginal ultrasonographically guided retrieval of oocytes for in vitro fertilization and embryo transfer. *Fertil Steril* 1993;59:1313–5.
- Bennett SJ, Waterstone JJ, Cheng WC, Parsons J. Complications of transvaginal ultrasound-directed follicle aspiration: a review of 2670 consecutive procedures. *J Assist Reprod Genet* 1993;10:72–7.
- Govaerts I, Devreker F, Delbaere A, Revelard P, Englert Y. Short-term medical complications of 1500 oocyte retrievals for in vitro fertilization and embryo transfer. *Eur J Obstet Gynecol Reprod Biol* 1998;77:239–43.
- Ludwig AK, Glawatz M, Griesinger G, Diedrich K, Ludwig M. Perioperative and post-operative complications of transvaginal ultrasound-guided oocyte retrieval: prospective study of >1000 oocyte retrievals. *Hum Reprod* 2006;21:3235–40.
- Bodri D, Guillén JJ, Polo A, Trullenque M, Esteve C, Coll O. Complications related to ovarian stimulation and oocyte retrieval in 4052 oocyte donor cycles. *Reprod Biomed Online* 2008;17:237–43.
- Khalifé S, Falcone T, Hemmings R, Cohen D. Diagnostic accuracy of transvaginal ultrasound in detecting free pelvic fluid. *J Reprod Med* 1998;43:795–8.
- Dessole S, Rubattu G, Ambrosini G, Miele M, Nardelli GB, Cherchi PL. Blood loss following noncomplicated transvaginal oocyte retrieval for in vitro fertilization. *Fertil Steril* 2001;76:205–6.
- Ragni G, Scarduelli C, Calanna G, Santi G, Benaglia L, Somigliana E. Blood loss during transvaginal oocyte retrieval. *Gynecol Obstet Invest* 2009;67:32–5.
- Battaglia C, Regnani G, Giulini S, Madgar L, Genazzani AD, Volpe A. Severe intraabdominal bleeding after transvaginal oocyte retrieval for IVF-ET and coagulation factor XI deficiency: a case report. *J Assist Reprod Genet* 2001;18:178–81.
- Hallatt JG, Steele CH Jr, Snyder M. Ruptured corpus luteum with hemoperitoneum: a study of 173 surgical cases. *Am J Obstet Gynecol* 1984;149:5–9.