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Case Report

A case report of peri-ovarian hematoma and hemoperitoneum following ovum pickup: a laparoscopic intervention

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ABSTRACT

A 29-year-old nulligravida woman with a seven-year history of primary infertility underwent transvaginal oocyte pick-up (TV-OPU) following controlled ovarian stimulation for *in vitro* fertilization (IVF) with intracytoplasmic sperm injection (ICSI). Post-procedure, she presented with abdominal pain and bilateral flank tenderness. There was significant haemoglobin drop and ultrasonography showed evidence of peri-ovarian hematoma. Initial conservative management, including close monitoring and intravenous antibiotics, was implemented; however, progressive haemodynamic compromise and hematoma expansion necessitated diagnostic laparoscopy. Intraoperatively, a right-sided peri-ovarian hematoma and active bleeding from the right ovarian puncture site were identified and surgically managed. The patient demonstrated an uneventful postoperative recovery and was discharged on day six. This case underscores the importance of vigilant monitoring, individualized management, and timely surgical intervention for post-TV-OPU complications.

Keywords: Peri-ovarian hematoma, Ovum pickup, Hemoperitoneum, Laparoscopy, Assisted reproductive techniques, Oocyte retrieval

INTRODUCTION

Transvaginal ovum pickup (TV-OPU) or oocyte retrieval is an ultrasound-guided procedure in *in vitro* fertilization (IVF) and intracytoplasmic sperm injection (ICSI) therapy in assisted reproductive techniques wherein oocytes are meticulously aspirated using a specialized needle connected to a suction system. However, it is associated with certain complications such as abdominal pain, failure of the egg collection procedure, infection, and vascular injury leading to hematoma formation.[1] Prevalence of intra-abdominal/ intra-peritoneal bleeding/ vaginal bleeding post ovum pickup is approximately 0.01% and 0.23%.[2] This report details a case of peri-ovarian hematoma with active bleeding post-ovum pickup that was successfully managed by laparoscopy.

CASE REPORT

A 29-year-old with body mass index (BMI) of 21.1 kg/m^2 nulligravida woman with a seven-year history of primary infertility presented with abdominal pain following TV-OPU performed the previous day. She had a history of multiple failed ovulation induction and intrauterine insemination (IUI) cycles. Three months prior, she underwent a hysterolaparoscopy, which revealed endometriotic lesions on the rectovaginal septum and adhesions, for which adhesiolysis was done and a blocked left fallopian tube on chromopertubation. Her husband's semen analysis also indicated severe oligoasthenoteratozoospermia. Given the patient's history of endometriosis, reduced ovarian reserve, failed IUI, as well as the husband's severe compromised sperm quality, IVF-ICSI intracytoplasmic sperm injection was recommended. Ovarian stimulation was carried out with 300 IU of human menopausal gonadotropin (HMG) and GnRH antagonist. Transvaginal ovum pickup was done under intravenous general anaesthesia and three oocytes were retrieved.

On the second day following ovarian pickup, the patient presented with abdominal and bilateral flank pain. She did

not report any vaginal bleeding, vomiting, or fever. Her vital signs were stable, and on abdominal examination, bilateral flank tenderness was noted. All blood parameters were within normal limits, except for a drop in haemoglobin from 9 g/dl (pre-operative) to 7.1 g/dl (post-operative). A transvaginal ultrasound revealed a (2.4×2 cm peri-ovarian hematoma with maximum vertical pocket (MVP) of 2 cm collection around it (Figure 1 and Table 1). The decision was made to manage the condition conservatively. The patient was started on intravenous antibiotics and one unit of packed red blood cells was transfused. Our plan of management for the patient was as follows.

Monitoring parameters

If the vitals remained stable and there was no increase in abdominal girth, plan was to repeat haemoglobin and conservative management would be continued, if there was worsening in haemoglobin level, then supportive treatment with blood transfusion would be done.

Escalation plan

Emergency laparoscopy would be undertaken if there was a deterioration in vitals (tachycardia or hypotension) or an increase in abdominal girth, as the next step in management.

On the third day post-ovum pickup, the patient's abdominal pain worsened on the right side. However, her vital signs remained stable, and she was afebrile. On abdominal examination, tenderness was noted on both flanks. A repeat ultrasound revealed a slight increase in the size of the hematoma, measuring (2.6×1.8 cm, with MVP-1.5 cm collection near the right ovary (Figure 1 and Table 1). Additionally, there was significant drop in haemoglobin to 6.4 g/dl. Given the significant decline in haemoglobin and slight enlargement of the hematoma, a decision was made to proceed with diagnostic laparoscopy.

During laparoscopy, the pelvic cavity was inspected. A right-sided peri-ovarian hematoma, approximately 5×4 cm, was noted. A small active bleed was observed at the right ovarian puncture site, and haemostatic sutures were applied. Approximately 200 cc of hemoperitoneum was noted in the pouch of Douglas, with minimal blood collection observed under the liver (Figure 1a-d). The left ovary appeared enlarged, but no obvious hematoma was seen. The patient's condition improved over the following days, and she was discharged on day 6 after ruling out any bleeding disorders.

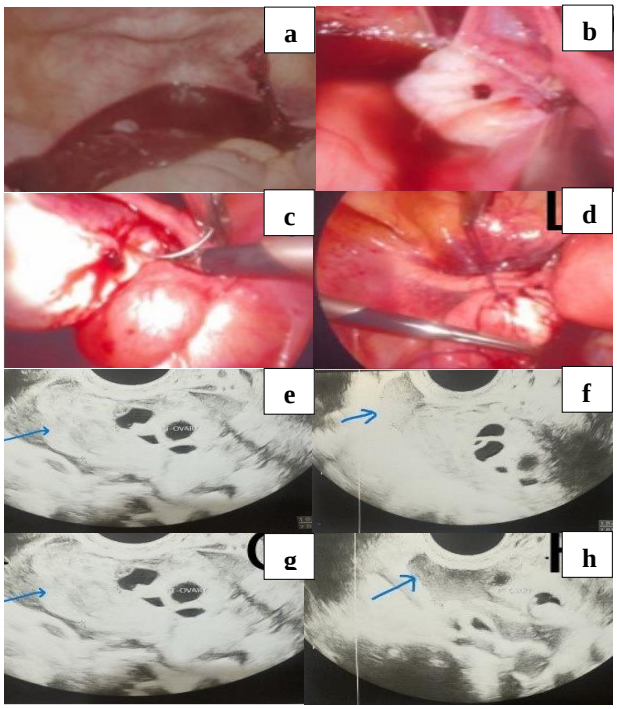

Figure 1: (a-d) Showcase the intra-operative images, (a) hemoperitoneum, (b) active bleeding from puncture site, (c) haemostatic sutures, and (d) after suturing); (e-h) showcase the pre-operative ultrasonographic images, (e and f) hematoma and hemoperitoneum (2.4×2 cm peri-ovarian hematoma, with MVP-2 cm collection near right ovary on day 2), and (g and h) hematoma and hemoperitoneum (2.6×1.8 cm hematoma, with MVP-1.5 cm collection near the right ovary on day 3).

Table 1: Ultrasonographic and haematological results recorded during the post ovum pickup period, before and after surgery.

Post ovum picks up day	Ultrasound findings (size of hematoma and blood around hematoma)	Haemoglobin (g%)	Platelet count (lakhs/cumm)	Total cell count (cmm)	Abdominal girth (cm)
2	2×2 cm, MVP-2 cm	7.1	2.03	11,070	30
3	2.6×1.8 cm, MVP-1.5 cm	6.4	1.46	6,700	30
4		9.8	1.26	13,300	
5		9.3	1.45	9,310	

DISCUSSION

TV-OPU is the preferred method for oocyte retrieval due to its straightforward approach, making it widely favoured and increasingly popular. It is a simpler and safer technique compared to the older, more complex methods such as laparoscopic and transabdominal approaches.[3] Every surgical procedure carries potential risks, and during

TV-OPU, inserting a sharp needle through the vaginal wall into the ovaries carries the risk of bleeding, infection, or damage to nearby abdominal organs. Though its rare but bleeding is the most common complication of TV-OPU.[3]

Several mechanisms have been suggested for the development of intra-abdominal hematoma following TV-OPU. These include repeated punctures of the vaginal vault and ovaries, with an elevated risk observed in lean PCOS patients due to their enlarged, overstimulated ovaries. Additional contributing factors may include abnormalities in coagulation, low platelet counts, or the use of anticoagulants or antiplatelet medications for underlying medical conditions. Another potential cause is the rupture of endometriotic or haemorrhagic cysts. Conditions such as a history of pelvic tuberculosis, pelvic inflammatory disease, prior abdominopelvic surgeries, or previous OPU procedures can lead to neovascularization. These newly formed, delicate blood vessels are prone to rupture, potentially causing hematoma during subsequent oocyte retrieval.[2]

Ovarian response to hyperstimulation is known to be more intense in lean as compared with overweight patients with PCOS. Lean women with PCOS often have elevated estrogen levels, which can contribute to a hypercoagulable state, theoretically reducing the risk of bleeding. However, this protective effect appears insufficient to counteract the delicate and sensitive nature of their ovarian tissue. This fragility increases the likelihood of bleeding despite the coagulative advantage, highlighting the complexity of managing such cases.[2] TV-OPU in this high-risk group should be performed with meticulous care and accuracy and continuous needle movement when inside the ovarian tissue should be avoided.

The initial approach to treatment can be conservative if the patient is hemodynamically stable, showing no significant drop in haemoglobin or haematocrit levels and no noticeable increase in peritoneal fluid volume (blood). The primary objective of conservative management is to preserve ovarian function and prevent ovariectomy.

Patients suspected of bleeding following TVOR should be admitted to the hospital for close observation. Regular monitoring should include serial measurements of blood haemoglobin levels and ultrasound assessments to detect intra-abdominal fluid. If haemoglobin levels decline, a blood transfusion may be necessary. If there is a drop in haemoglobin levels or acute abdominal pain, diagnostic laparoscopy as the first step of the treatment should be promptly performed to identify and surgically manage the source of bleeding.[4]

In our case, it became evident that the patient was not responding to conservative management, as the hematoma continued to grow and haemoglobin levels dropped. Consequently, the decision was made to proceed with surgery. It is crucial not to delay surgical intervention if the patient's condition fails to improve, as prolonged postponement can result in life-threatening complications such as haemorrhagic shock, disseminated intravascular coagulation, or sudden death.[4]

CONCLUSION

This case highlights the importance of a vigilant approach in managing complications following TV-OPU. While TV-OPU is generally safe, however it carries a rare risk of severe complications like intra-abdominal hematoma and active bleeding. Conservative management is appropriate for stable patients, but timely surgical intervention is critical when clinical or ultrasonographic parameters deteriorate.

In this case, prompt diagnostic laparoscopy not only identified the source of bleeding but also ensured the patient's recovery without compromising ovarian function. This emphasizes the need for early recognition and decisive action to prevent life-threatening outcomes such as haemorrhagic shock or disseminated intravascular coagulation. Optimal care involves a multidisciplinary approach with continuous monitoring and a readiness to escalate treatment when conservative measures fail.

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