Transvaginal Oocyte Retrieval in IVF: Should we really be scared of the procedure?

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Introduction

Since the birth of the first IVF baby, a baby girl 'Louise Joy Brown' in 25th July 1978 [1] and the first IVF boy 'Alastair MacDonald' in 14th January 1979 [2], millions of successful IVF births took place till date. Initially oocyte retrieval was a real challenge and people had taken oocyte by laparotomy and/or by other laparoscopic techniques. These techniques were very difficult and in many cases unsuccessful because of severe tubal disease, multiple adhesions or hidden ovaries. The overall success rate was less than 50% [2]. Improvement in the success rate of OPU to 60-80% per follicle occurred between 1979 and 1980 when a foot-controlled fixed aspiration pressure control was introduced [3] and specially designed Teflon-lined aspiration needles with beveled points were used [4]. Transvaginal oocyte retrieval (TVOR) technique was first developed by Pierre Dellenbach and colleagues in Strasbourg, France, and reported in 1984 [5].

OPU or TVOR is usually done under general anesthesia (GA) with the help of transvaginal sonography (TVS) after 34 to 36 hours of trigger i.e. human chorionic gonadotropin (hCG) administration [6].

Equipments, Accessories and Pre-OPU Preparation

Since it is invasive procedure and needs expertise in assessment of TVS pictures, many clinicians do not find oneself competent in doing it at their centers. Hand-eye co-ordination, accurate assessment of 2D-ultrasound images, simultaneous puncturing the follicle by needle in one hand, firm holding of the ultrasound transducer by the other hand and putting continuous pressure on foot paddle for suction; These all scare the performing IVF specialist and put this simple procedure in to a messy category. Here, I will elaborate all these procedure in a very simple way with do's and don'ts with all necessary alert flags.

At Om IVF Varanasi India, we do OPU with the help of GE LOGIQ™-F6 ultrasound machine having GE E8C-RS Micro Convex Endocavity Probe (4-10 MHz) with guide. A metallic needle guide is attached over the probe in specified groove after covering the probe with the sterile latex probe cover. Very small amount of conducting jelly is put at the tip of the probe for better conduction. Before starting the procedure, patient is instructed to void the bladder completely. The patient after positioned in lithotomy is given GA (mostly Propofol). Local part is prepared by thorough washing with lukewarm normal saline to eliminate any infection and contamination. The patient is then properly draped and vaginal ultrasound transducer is introduced to do baseline scanning of both the ovaries and the uterus. We use 17G, 35 cm, single lumen OPU needle of Surgimedik™ (OPICK-SL Single lumen Ovum Pick-up) with echo tip marking for better tip orientation during OPU. One end of the tubing is attached to the collection tube and other end is attached to the ovum aspiration pump (Rocket Craft™ Medicals UK).

Transvaginal Oocyte Retrieval Technique and Recommendations

To begin with, some media is aspirated to check the proper functioning of the ovum aspiration system and then needle is introduced through the guide. Before puncturing the vagina, one must rest assured for the level of anesthesia as this is very painful and low level of anesthesia may cause patient's undesirable movements and subsequently local injury by the needle. The very important point here to remember is that vaginal endo-probe must be fully effaced with the vaginal wall and the target ovary. Full pressure must be applied over the vaginal wall for the maximum possible approximation of the vaginal wall and the target ovary to avoid coming any other intervening structure. This amount of pressure must be sustained throughout the OPU with one hand and the other hand should be free to manipulate the needle for aspiration of the follicles. In our practice, we use to put color-flow on the target ovary to find out the precise position of the vessels to avoid any complication. It is our recommendation that one should freely use color-flow during aspiration because the position of the vessels also alters as the ovary moves after subsequent aspirations. One more helpful recommendation to the beginners and even for the experienced that to put gain settings of ultrasound machine should be on higher side to brighten the capsule of the ovary (Figure 1) i.e. the limiting boundary of aspiration and to avoid inadvertent entry to the great vessels. In this setting, the vessels which lie outside the ovary are clearly visible against the contrast of the ovarian capsule. Another maneuver can also differentiate between the follicle and the vessel is that in case of doubt transducer of the ultrasound should see cross-section and the longitudinal-section both of the entity concern, the follicle will remain oval or ovoid whereas vessel will take long tunnel like picture.

After assuring all settings well, OPU begins by puncturing the target ovary. Some clinicians suggest the larger follicles should be aspirated first, some suggest start aspiration from periphery, but at Om IVF, we always do it by 'First come-First serve' basis means after puncturing the ovary whichever follicle comes in the way, aspirated and then it continues in a sequential fashion. This way of aspiration avoids unnecessary intra-ovarian bleeding, inadvertent rupture of follicles without being aspirated and most importantly precise and continuous view of needle throughout the procedure. As on the screen of ultrasound machine we get only 2D images, at times it seems that follicles are on the way whereas needle is not aspirating the content. In this situation, one should withdraw the needle little bit but not from the ovary and again progress forward to puncture the desired follicle. This

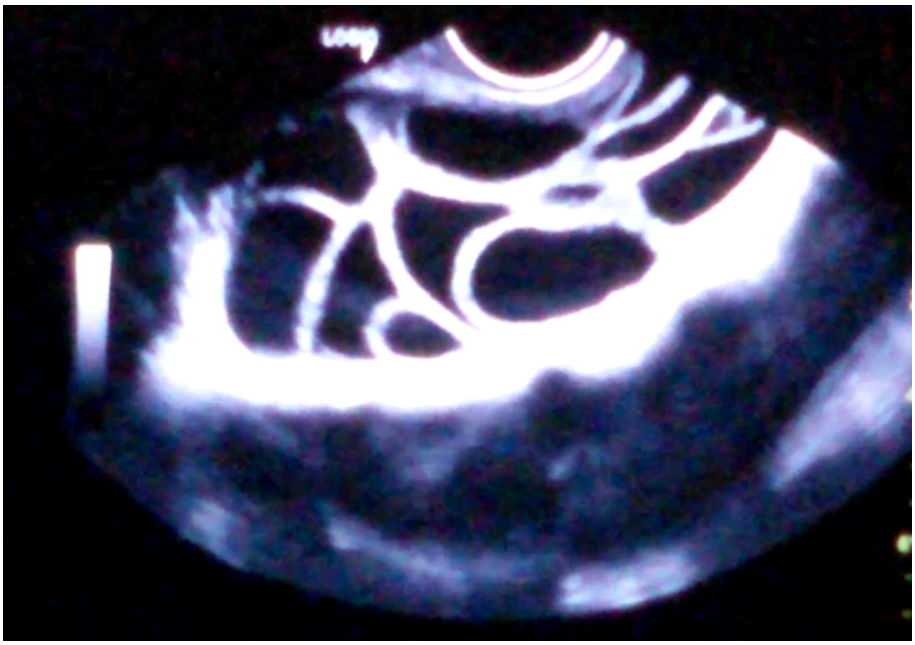

Figure 1: *Brighten capsule of the ovary by increasing gain of the ultrasound machine.*

technique avoids multiple punctures of the ovary and vagina which in turn minimizes the trauma and infections. If after doing all maneuvers the aspiration is negative, one must withdraw the aspiration needle completely and aspirate the media one or two times to flush the system for any possible block. Pressure of the aspiration pump should be 100-120 mm of mercury. In any circumstances, pressure increases above the 200 mm of mercury, one should stop the procedure, take the needle out completely, flush it with the media and recheck the pressure by aspirating media to avoid any damage to the ovary and aspiration pump as well. After completing one ovary, same procedure is repeated for the other ovary. At the end of the procedure, one must look for contours of both the ovaries and pelvis for any blood collection. Vaginal bleeding is usually not troublesome and very well stopped by applying pressure with gauge pad. Patient should be kept under observation for 2-3 hours. We routinely give one shot of intravenous Ceftriaxone 1 gm as prophylaxis and allow oral feeds after 3 hours. Few patients need single shot of analgesic for abdominal and vaginal pain.

Complications

Complications are an integral part of any invasive procedure but if one cares for the alert flags, these are very uncommon with OPU. The main risks are post-procedure pain, infection (0.6%) and bleeding (>100 mL in 0.8% cases) [7], which may serious or even fatal but all these can be managed by laparoscopy or laparotomy. Other complications may result from the administration of intravenous sedation or general anesthesia. These include asphyxia caused by airway obstruction, apnea, hypotension, and pulmonary aspiration of stomach contents.

Conclusions

Conclusively, I would like to encourage every gynecologist/ infertility specialist who is doing IVF must perform OPU without any hesitation. Though it is very tricky and at times tedious procedure but one must attempt for it by keeping recommendations in mind to avoid unnecessary complications. In the beginning do not attempt aspiration of the follicle in the following situations like follicle just abutting the vessel, moving ovary, difficult puncturing after several attempts, dry aspiration, small peripheral follicles, obvious intra-ovarian or peritoneal bleed, and in ovary situated deep and posterior to the uterus. One must keep in mind that the aim of the procedure is to retrieve ovum sufficient enough to offer pregnancy rather than banking. The working embryologist must be fair enough to the gynecologist by giving timely updates of the count of good quality oocyte so that no one should take heroic risk in search of more and more oocyte. This recommendation does not restrict anyone for easy going complete retrieval but putting alert flag before avoidable damages.

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