The follicular stigma—a window for better understanding of ovulation

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Introduction

The lack of understanding of human ovulation mechanism is unconceivable considering that the human race survival relies upon the release of the largest female body cell into the oviduct and subsequent fertilisation by sperm present in the ampulla. Despite significant progress in data capture during minimally access surgery only two papers to date present the appearances of a periovarian ovary [1, 2]. As no biochemical test can reveal the exact moment of ovulation and the only proof that an oocyte has been released is the subsequent establishment of a pregnancy, the process of ovulation is still surrounded in mystery.

Case report

This is the case of a 34-year-old woman presenting with normal ovarian reserve (FSH=2.6 IU/L, LH=0.6 IU/L) and biochemical evidence of ovulation (progesterone=69 nmol/L). The male partner presented with hypogonadotropic hypogonadism secondary to a road traffic accident. His gonadotrophins were FSH=0.2 IU/L and LH=0.2 IU/L and semen analysis showed azoospermia.

Capsule Laparoscopy reveals an earlier stage of ovulation than previously reported.

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Following replacement therapy with rFSH (Puregon) 75 IU and hCG (Pregnyl) 150 IU 3 times weekly spermatogenesis commenced and conception occurred after 5 months. A healthy boy was delivered by caesarean section at term. The couple presented with secondary infertility of 10 months duration with a repeat normal semen analysis.

To complete the investigations a laparoscopy was proposed and performed on day 14 of cycle. During this procedure a normal pelvic appearance was evident. Instillation of blue dye showed bilaterally patent tubes. Upon closer inspection of the right ovary a periovarian follicle was evident. The surface was very vascular (blister) and a circular area of lysis was observed (stigma). This represents the initiation of ovulation through lysis of the follicular wall in a very clear circular pattern (window) (Fig. 1).

Discussion

Previous images of assumed ovulation have been published [1]. As this is a dynamic event the collection of a series of pictures rather than isolated views could possibly elucidate this enigmatic process. We are contributing images which we believe are at the initiation of ovulation and underline a discrete area of lysis on the background of a highly vascularised blister. In our opinion, this event precedes the one described by Lousse and Donnez [1] which most likely represent either the release of the oocyte or possibly the end of ovulation and reseal of stigma.

Most likely ovulation is a delicate rather than an “explosive” release of a cumulus-oocyte complex. One question still needs to be answered: is the release of the oocyte a consequence of a weakening ovarian wall to the point of total lysis or is there an ovarian contractile

Fig. 1 Laparoscopic view of initiation of ovulation

activity present to “push” the follicular fluid and oocyte through the stigma? Furthermore, the relationship between the ovary at time of ovulation and the Fallopian tube is poorly understood as is the exact mechanism of oocyte release/ aspiration at the fimbrial end. This could be the next imagistic target!

References

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