



# The Third Ovary-Superfluous Ovary

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## Abstract

We report a case of a 25-year-old female who presented with primary infertility with AMH value of 9 ng/ml, and ultrasound image suggesting the possibility of three ovaries seen in two different planes and no polycystic pattern in any ovary. Diagnostic laparoscopy performed in this patient revealed two ovaries on the left side, placed in normal anatomical position. Both having their individual ovarian ligaments connecting both the ovaries separately with the cornual end of the uterus on the left side. However, only the lateral one of the two ovaries on the left was attached to the lateral pelvic wall with infundibulopelvic ligament. The adnexa on the right side was normal. Biopsy confirmed this accessory tissue as an ovary. The “third ovary” in our case is a functional ovary. This explains the rise of AMH value. The ovary responded to ovulation induction, and follicles were retrieved thereafter which later showed fertilization. Hence, confirming their functionality. The occurrence of third ovary has been established in the literature. However, none of the definitions supports our finding, that is, the presence of third functional ovary attached with ovarian ligament and no infundibulopelvic ligament. Hence, we name this unique occurrence as “Superfluous Ovary”.

**Keywords** Triple ovary · Superfluous ovary · Accessory ovarian tissue · Laparoscopic surgery · Female infertility · Case presentation and discussion

This is a case of a 25-year-old female with normal female karyotype, who presented to us with primary infertility for 7 years. Her investigations revealed FSH: 5.2 IU/ml, LH: 6.1 IU/l, Estradiol: 40 pg/ml, AMH: 9 ng/ml. Husband semen analysis was within normal limits. On ultrasound imaging, two ovary-like structure with follicles on the left (in different planes) and one ovary on the right were visualized. With this ambiguity, patient consented for diagnostic laparoscopy.

Intraoperative: there was one, phenotypically normal uterus, 2 fallopian tubes, all in anatomically normal position

were noted. Two ovaries on the left side, placed at the normal anatomical position were visualized. Both ovaries had one ovarian ligament each. However, only the lateral one of the two ovaries on the left side was attached with the infundibulopelvic ligament as shown in Fig. 1. Right side had one normally placed ovary with normal attachments. Biopsy from the ovary without the infundibulopelvic ligament confirmed ovarian tissue on histopathology.

The occurrence of more than 2 ovaries is a rare entity. Multiple theories have been proposed to explain the presence of the third ovary. Wharton [1], in 1959, highlighted the association of supernumerary ovaries with congenital malformations involving urogenital system. In 1963, Pearl et al. [2], suggested that when the migration of some primitive germ cells is arrested at some point during the course of normal migration to the gonadal ridges, their inductive influence on the surrounding epithelium leads to the formation of ectopic ovarian tissue. In 1973, Printz et al. [3], suggested the possibility of gonadal ridge transplantation or migration. Lachman [4], in 1991, hypothesized that supernumerary ovaries may be secondary to implantation of dislodged ovarian tissue due to previous pelvic surgery or pelvic inflammatory disease.

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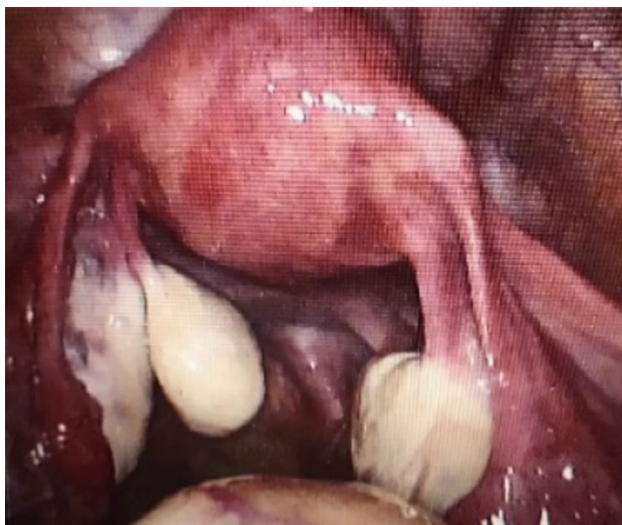
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**Fig. 1** Laparoscopic image of superfluous ovary along with normal right and left ovaries and fallopian tubes

With this literature, terminology and classification relevant to our finding were suggested which are now commonly used. Those are as follows:

1. *Supernumerary ovaries* ovarian tissue entirely separated from the normally placed ovary. There is no ligamentous or direct connection with the ovaries, broad ligament, utero-ovarian ligament or infundibulo-pelvic ligament, and it arises from a separate primordium [1].
2. *Accessory ovary* the excess ovarian tissue is situated near the normally placed ovary, may be connected with, and seems to have developed from it, possibly from tissue that was split from the embryonic ovary during early development [1].
3. *Ectopic ovary* the term was used by Lachman in 1991 to replace both terms, supernumerary and accessory ovary. It describes any ovarian tissue additional to normal ovaries with further sub-classification as post-surgical implant, post-inflammatory implant or true (embryogenic) [4].

The condition that we encountered, does not fit in the above-mentioned terminologies thereby making it unique. The presence of the third ovarian ligament excludes this condition to be termed as supernumerary or duplication or accessory ovary. In the author's opinion, it is important to acknowledge this discovery and give it a separate identity and not simply an unusual case of "extra ovary". We think the term "Superfluous ovary" is a good descriptor of this condition. Superfluous means "more than you need". In this unusual case, the third ovary is a complete, functional entity that the patient possessed but does not

need it, as she has two normal ovaries as well. Embryologically, superfluous ovary may have developed due to the excessive mesenchymal proliferation on one side, due to which thicker gubernaculum was formed that subsequently duplicated. The excess of the mesenchymal cells could be the reason for double gonadal ridges on one side thereby forming superfluous ovary on one side only.

The superfluous ovary, in our case, is functional. This could be explained with the fact that it responded to the ovarian stimulation. The follicles retrieved from this ovary later showed fertilization. The risk of malignant transformation in any ectopic or accessory tissue is very rare and has been reported mainly in accessory breast or ectopic thyroid tissue. In gynecological conditions, malignant transformation is reported, although rare, in cases of endometriosis or ovarian remnant syndrome. Since, in our patient, all the three ovaries appeared normal and did not have signs of endometriosis, we could not justify removing this unusual presence of a fully functioning superfluous ovary. We believe that the risk of malignant transformation in superfluous ovary is not more than any other normally occurring ovary. However, the risk of ovarian malignancy in this female, in particular, may be higher than the normal female population, which may be consistent with the increased risk of malignancy in women undergoing ovarian stimulation. With the advent of endoscopy and ART, discoveries of rare occurrences are bound to happen. Separate identification and acknowledgement of these discoveries play an important part in understanding their impact on human reproduction. While the naming and classification of such occurrences is the first step, how this ovary responds in the future is a subject of further research.

## Declarations

**Conflict of interest** There is no conflict of interest.

**Informed Consent** Informed consent for publication of this report has been obtained from the patient.

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