

The third ovary- Superfluous ovary

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This is a case of a 25-year-old female with normal female karyotype, who presented to us with primary infertility. Investigations revealed AMH level of 9ng/ml. 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 on the left side was attached with the infundibulopelvic ligament. Right side had one normally placed ovary with normal attachments. Biopsy from the ovary without the infundibulopelvic ligament confirmed ovarian tissue on histopathology. Figure 1 and 2 are the labelled and unlabelled, respectively, laparoscopic images of our finding.

The occurrence of more than 2 ovaries is a rare entity. Multiple theories have been proposed to explain the presence of the third ovary. Wharton¹, in 1959, highlighted the association of supernumerary ovaries with congenital malformations involving urogenital system. In 1963, Pearl et al², 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 al³, suggested the possibility of gonadal ridge transplantation or migration. Lachman⁴, in 1991, hypothesized that supernumerary ovaries may be secondary to implantation of dislodged ovarian tissue due to previous pelvic surgery or pelvic inflammatory disease.

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 infundibulopelvic ligament and it arises from a separate primordium¹.
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 development¹.
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. Hence, the rarity of this observation or occurrence is worth reporting.

We think the term “superfluous ovary” is a good descriptor of this condition. 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, was functional. This could be explained with the fact that it responded to the ovarian stimulation. Though the literature suggests that ectopic tissue should be removed due to their possibility of malignant transformation, we could not justify removing this unusual presence of a fully functioning superfluous ovary. Subsequent follow-up will explain the fate of this unique occurrence.

References:

1. Wharton L.R. (1959) Two cases of supernumerary ovary and one of accessory ovary with an analysis of previously reported cases. *American Journal of Obstetrics and Gynecology*, 78, 1101–1109.
2. Pearl M, Plotz EJ. Supernumerary ovary. Report of a case. *Obstet Gynecol* 1963;21:253-6.
3. Printz JL, Choate JW, Townes PL, Harper RC. The embryology of supernumerary ovaries. *Obstet Gynecol* 1973;41:246-52.
4. Lachman M.F. and Berman M.M. (1991) The ectopic ovary, a case report and review of the literature. *Archives of Pathology Laboratory Medicine*, 115, 233–235.

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Figure 2 Laparoscopic image of superfluous ovary along with normal right and left ovaries and fallopian available at <https://authorea.com/users/327261/articles/454867-the-third-ovary-superfluous-ovary>