Case Report

The Right Ovarian Artery Arising from the Right Inferior Phrenic Artery: A Case Report

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Objective: *To report a case of the right ovarian artery arising from the right inferior phrenic artery.*
Material and Method: *The authors carried out the standard dissection survey of 810 embalmed female cadavers between 1983 and 2010.*
Results: *The authors encountered a case of the right ovarian artery arising from the right inferior phrenic artery in a donated cadaver aged 53 years at decease.*
Conclusion: *With the advent of intra-abdominal laparoscopic techniques, the anatomy of the ovarian artery has assumed much more importance.*

Keywords: *Right ovarian artery, Right inferior phrenic artery, Anatomy*

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The ovarian arteries usually arise from the abdominal aorta and originate below the renal arteries. Each descends behind the peritoneum, and at the brim of the pelvis crosses the external iliac artery and vein to enter the true pelvic cavity, and then enter the suspensory ligaments of the ovaries[1,2]. The ovarian artery may arise from the main or accessory renal artery, suprarenal, inferior phrenic, superior mesenteric, lumbar, common iliac, and internal iliac arteries[3-8]. The anatomy of the ovarian artery has assumed importance because of the development of new operative techniques within the abdominal cavity[9]. Thus, it becomes imperative to carefully preserve the ovarian artery in order to prevent any vascular troubles of the ovary.

Material and Method

The authors carried out 810 embalmed Thai female cadavers between 1983 and 2010. The standard dissection techniques were carefully employed. The student dissections were clearly supervised by the experienced anatomists. The entire anterolateral abdominal wall was removed to provide free access to the posterior abdominal wall. The entire gastrointestinal parts anterior to the renal components were removed to allow maximum access to the posterior abdominal wall and its contents. Components on the posterior abdominopelvic wall were identified and dissected finely. The ovarian arteries were carefully observed.

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Results

The ovarian arteries originated from the abdominal aorta in 769 cadavers (94.94%), the renal arteries in 40 cadavers (4.94%), and the inferior phrenic artery in one cadaver (0.12%). The right ovarian artery that arose from the right phrenic artery coursed downward in front of the right renal vein and close to the medial border of the right kidney (Fig. 1). There were three ovarian veins observed on the right posterior abdominal wall. Two of them terminated in the inferior vena cava, and the most lateral one in the right renal vein. The pelvic course of these blood vessels was normal.

Discussion

The variation study of origin and course of ovarian arteries are relatively few[3-7]. In the present

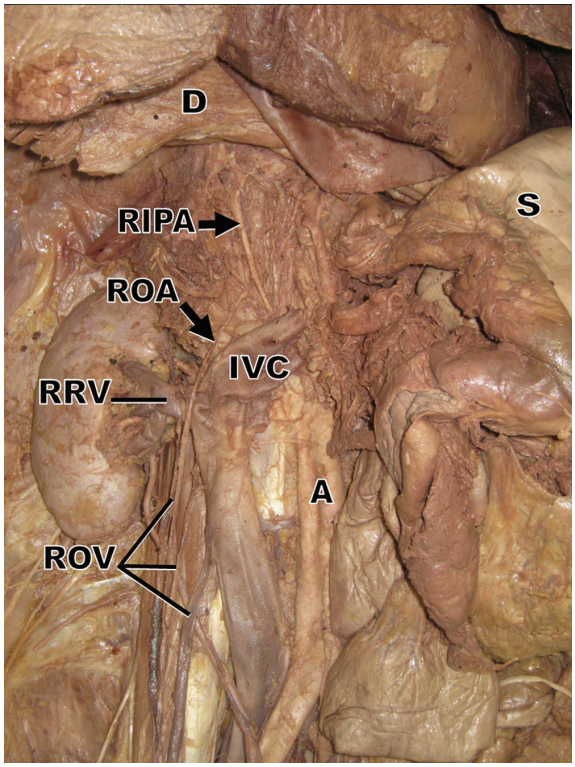

Fig. 1 Posterior abdominal wall of a female cadaver showing right ovarian artery (ROA) originated from right inferior phrenic artery (RIPA)
A = aorta; D = diaphragm; ROV = right ovarian veins; RRV = right renal vein
Inset: higher magnification of RIPA and ROA

study, the uncommon origins of ovarian arteries were observed in 5.06% of the cases. The upper parts of the arteries lie in a higher position than usual and located around the hilar region of the kidneys. This increases the risk of ovarian blood loss during the surgical procedures in the renal pedicle.

The inferior phrenic artery originates from either the abdominal aorta or celiac trunk. The branches include diaphragmatic, suprarenal, inferior vena caval, esophageal, and splenic arteries. The inferior phrenic artery can communicate with internal thoracic artery and other systemic vessels of the thorax such as musculophrenic artery. The right inferior phrenic artery potentially anastomoses with the intrahepatic arteries. One of the most common sources of extrahepatic blood supply to the liver is the right inferior phrenic artery[8-10]. When the right inferior phrenic artery is embolized, there is a risk of embolizing non-target branches, which can lead to a variety of complications. The present study reveals an uncommon case of which the right ovarian artery originated from the right inferior phrenic artery. Radiologists must be aware of the anatomical variation of the ovarian artery so that proper interventional management can be accomplished when pathologic conditions related to the inferior phrenic artery are associated.

It is known that genetics, various chemical agents, growth/transcription factors, and hemodynamic forces may all take part in selection and persistence of a particular congenital vascular channel[13]. The variations of ovarian artery are attributed to embryological origin, which is very complex. According to Felix[14] nine lateral mesonephric arteries of the embryo can be divided into three groups, namely: cranial, middle, and caudal. Any one of these nine lateral mesonephric arteries may eventually become the gonadal arteries, which commonly arise from the caudal group. The existence of a high-positioned ovarian artery has been explained by the persistence of a mesonephric artery from the cranial part.

Conclusion

The right ovarian artery originated from the right inferior phrenic artery seems to be an under-recognized variation, which may be of particular importance to radiologists and surgeons, especially urologists. The results of the present study suggest an embryonic error in the formation of the right ovarian artery.

Potential conflicts of interest

None.

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หลอดเลือดแดงโอวาเรียนข้างขวาที่มีต้นกำเนิดจากหลอดเลือดแดงอินฟีเรียร์ ฟรีนิคข้างขวา: รายงาน 1 ร่าง

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