Gonadal Veins: MR Imaging findings in an unselected population.

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Introduction

Pelvic Congestion Syndrome (PCS) is characterized by chronic pelvic pain exacerbated by postural changes and walking, often associated with congestive dysmenorrhoea, deep dyspareunia, postcoital ache, and emotional disturbance. Some authors have concluded that the primary problem in ovarian and pelvic varices was retrograde flow in incompetent gonadal veins (1,2). The diagnosis of PCS has usually been suggested by venography, or nonivasively by ultrasound with Doppler. However, ultrasound doesn´t depict the gonadal veins, the anatomy of which is important for treatment planning. CT and MRI can usually show pelvic and ovarian varices, as well as the gonadal veins. With MRI, the hazardous effects of radiation and iodinated contrast are avoided.

Our aim is to evaluate the spectrum of MR venographic findings of the ovarian veins in an asymptomatic population, correlated with clinical history and surgical findings, for potential comparison to patients with PCS.

Methods

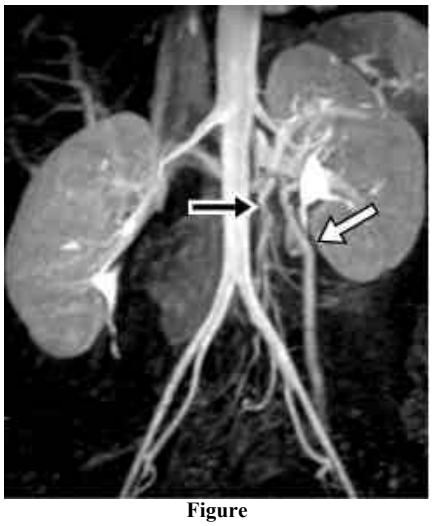
Two radiologists retrospectively reviewed the exams of 22 women (mean age 38 years) who had MR angiography for potential renal donation. Clinical charts were reviewed and patients were asked about symptoms of chronic pelvic pain and the number of children.

Coronal MR angiography was performed on a 1.5T unit, using a phased-array torso coil. A 3D fast spoiled gradient-echo sequence (TR=7ms, TE=2.2ms, 45 degrees flip angle, FOV=270 to 320 mm, 256 x 160 matrix, slice thickness 3mm with 50% overlap interpolation) was obtained three times after 0.1 to 0.2mmol/kg of gadopentetate dimeglumine was administered. A timing bolus injection was used to determine the timing for the first pass arterial sequence, followed by two consecutive similar sequences. Reconstructions with MIP (maximum intensity projection) were performed in most cases.

The gonadal vein (GV) diameter, the temporal phase of enhancement, and the presence of pelvic varices were observed. Passive reflux to the GV was considered when complete filling was seen in the first arterial phase, or when the cranial venous segment was identified on the first or second phase. Results were compared using an one-tailed distribution t-test.

Results

Of the 22 exams, 21 left gonadal veins were identified. Passive reflux from the left renal vein into the left gonadal vein (LGV) was suggested in 8 (38%). These mean diameter of these veins was 6.4±1.57 mm, significantly larger than 4.5±1.27 mm for the other 13 LGV without reflux ($P<0.005$). In 4 (18.2%) of 22 women, passive reflux from the left renal vein to the left lumbar venous plexus was observed, with surgical confirmation in 2. The right gonadal vein (RGV) was identified in 8 of 22 women, with a mean diameter of 4.4±0.51mm. Pelvic varices were detected in one case. No patient had symptoms of chronic pelvic pain.



Figure

Fifty-year-old woman with signs of passive reflux into the LGV and into the left ascending lumbar vein. MIP image acquired after the intravenous gadolinium shows both the gonadal vein (white arrow) and lumbar plexus (black arrow).

Discussion

Our results show that passive reflux to the LGV occurs in an asymptomatic population, even in the supine position. These findings are supported by anatomical studies, where the authors concluded that the conditions for reflux existed anatomically in a high percentage of normal subjects because of incompetence or lack of valves in the GV (3,4). In our study, the mean diameter of the left and right gonadal veins are comparable to the normal diameter of 5mm of these veins when studied with venography (5). There were 4 (18%) of 22 exams with passive reflux from the left gonadal vein to the left ascending lumbar vein. Dilated lumbar plexus has been related to recurrence symptoms after bilateral gonadal vein embolization in PCS, and to nocturnal back pain in some cases of portal hypertension, pregnancy, and congestive heart failure with spinal stenosis.

The limitations were that the technique used was not optimized for MR Venography. Higher temporal resolution and/or inclusion of time-of-flight or phase contrast technique would have allowed unambiguous determination of flow direction in more women. Additionally, the women were scanned supine, so gravity was not a factor for encouraging reflux.

The authors concluded that passive reflux from the left renal vein to the left gonadal vein can occur in asymptomatic women. Diagnosis of pelvic congestion syndrome depends heavily on appropriate clinical history.

References

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