



Diagnostic Imaging and Endovascular Treatment of Pelvic Congestion Syndrome

Essay

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In Diagnostic and Interventional Radiology*

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*With thanks to God almighty I dedicate this
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List of Abbreviations

Abbreviation	Name
Ao	Aorta
CFD	Color Flow Doppler
CT	Computed Tomography
DV	Direct Venography
FDG	Fluorodeoxyglucose
FFE	Fast Field Echo
FLASH	Fast Low Angle Shot
Gd	Gadolinium
GnRH	Gonadotropin Releasing Hormone
GRE	Gradient Echo
HRT	Hormone Replacement Therapy
IV	Intravenous
IVC	Inferior Vena Cava
IVC	Inferior Vena Cava
LK	Left Kidney
LRV	Left Renal Vein
MDCT	Multidetector Computed Tomography
MHz	Megahertz
MPA	Medroxy Progesterone Acetate
MPFF	Micronized Purified Flavonoid Fraction
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Imaging
MRV	Magnetic Resonance Venogram
NBCA	N-Butyl-2-Cyanoacrylate
NSAIDs	Nonsteroidal Anti-Inflammatory Drugs
O	Ovary

OVR	Ovarian Vein Reflux
PACS	Picture Archiving and Communication system
PCCO	Pelvic Congestion Cystic Ovaries
PCS	Pelvic Congestion Syndrome
PCVM	Phase-contrast Velocity Mapping
PET	Positron Emission Tomography
PTFE	Polytetra-fluoroethylene
PUVs	Para Uterine Veins
PVI	Pelvic Venous Incompetence
RLRV	Retroaortic Left Renal Vein
SC	Subcutaneous
SMA	Superior Mesenteric Artery
TAUS	Trans-Abdominal Ultrasound
TCE	Trans-Catheter Embolization
TE	Time to Echo
TR	Time to Repeat
TRICKS	Time Resolved Imaging of Contrast Kinetics
TR-MRA	Time Resolved Magnetic Resonance Angiography
TSE	Turbo Spin Echo
TV-US	Trans-Vaginal Ultrasound
TWIST	Time-Resolved Angiography with Interleaved Stochastic Technique
U	Uterus
U/S	Ultrasound
VENC	Velocity Encoding

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INTRODUCTION

Chronic pelvic pain (CPP), a noncyclic pelvic pain of more than 6 months duration, is a common health problem among women (**Black et al, 2010**). It is estimated to affect as many as 39.1% of women at some point in their lives (**Venbrux et al., 2012**).

Pelvic congestion syndrome (PCS), First described by Richet in 1857, has been shown to be the underlying aetiology in a significant proportion of patients with chronic pelvic pain (**Liddle and Davies, 2007**).

Incompetence of the ovarian veins and venous reflux are considered the main underlying abnormality in patients with pelvic congestion syndrome, which is typically seen in multiparous women. The absence of valves in the ovarian veins, the compression of the left renal vein between the aorta and the superior mesenteric artery, and left renal vein variations may also be contributing factors (**Karaosmanoglu.et al., 2009**)

Because of the protean manifestations of PCS and the limited appreciation of this condition by both clinicians and radiologists, PCS is a probably under-recognized condition (**Ganeshan et al., 2007**).

It is estimated that as many as 80% of pelvic varices go undetected by laparoscopy as a result of technical limitations, which include compression of the varices from peritoneal CO2 insufflation and the resultant decompression of varices while the patient is in Trendelenburg position (*Black et al., 2010*).

In recent years, Advancements in technology have paved the way for the availability of non-invasive imaging (ultrasound, CT and magnetic resonance venography) (*Freedman et al., 2010*). They play a central role in establishing the diagnosis, excluding alternative causes of pelvic pain and providing a road map for novel minimally invasive treatment options that are now available (*Freedman et al., 2010*).

Combined trans abdominal and transvaginal sonography are potentially useful as a non-invasive screening tool for determining which patients with chronic pelvic pain may benefit from selective ovarian venography and trans catheter embolization (*Park et al., 2004*).

Cross-sectional imaging is typically performed before venography to exclude a concurrent pelvic pathologic process. Although CT and MR imaging can demonstrate pelvic varices, published experience is limited and lacks correlation with venography (*Black et al., 2010*).

Magnetic resonance phase-contrast velocity mapping is a useful tool for diagnosing Pelvic Congestion Syndrome and can avoid invasive procedures such as direct venography (*Meneses et al., 2010*).

Although US, CT, and MR imaging can demonstrate dilated pelvic veins in the majority of cases, selective venography remains the gold standard in diagnosing PCS (*Ganeshan et al., 2007*).

Treatment options for PCS remained elusive until recently, due to controversial diagnostic methods and poor understanding of its etiology (*Ignacio et al., 2008*).

The traditional treatment of pelvic congestion syndrome has included both medical (analgesics, hormones) and surgical approaches (hysterectomy, ovarian vein ligation) (*Pieri et al., 2003*).

Recently, minimally invasive, day-case-based, percutaneous trans-catheter embolization has also been proposed in pelvic congestion syndrome and chronic pelvic pain that do not respond to medical therapy (*Pieri et al., 2003*). Less expensive than surgery, this therapeutic option is safe, effective, minimally invasive and capable of restoring patients to normal function (*Pieri et al., 2003*).

AIM OF THE WORK

To briefly describe the clinical manifestations of Pelvic Congestion Syndrome, and to review the role of diagnostic and interventional radiology in the management of the probably under-diagnosed condition.