2D and 3D Echocardiography
Safe and Efficient Transseptal Puncture

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NO DISCLOSURES
Outline
History of Transseptal Puncture
Embryological/Anatomical/Echo Perspective
Nomenclature/Common Language
Echocardiographic Technique

Transeptal Puncture
Integral Component
Electrophysiological & Structural Heart Interventions
The Ureteropelvic Junction and the Hydronephrosis Syndrome

Abstract

The ureteropelvic junction (UPJ) is a critical structure in the urinary tract. It is the site where the renal pelvis connects to the ureter. Dysfunction at this level can lead to various conditions, including hydronephrosis, which is characterized by an enlargement of the renal pelvis due to obstruction.

Incidence and Etiology

Hydronephrosis is relatively common, with an estimated prevalence of 1% in the general population. The obstruction at the UPJ is the most common cause of hydronephrosis, accounting for approximately 70% of cases. Other causes include congenital anomalies, tumors, and strictures.

Clinical Manifestations

Symptoms of hydronephrosis can range from asymptomatic to severe, depending on the severity and duration of the obstruction. Common symptoms include flank pain, dysuria, and hematuria. In severe cases, there may be nausea, vomiting, and even renal failure.

Diagnosis

Diagnosis of hydronephrosis typically involves imaging studies such as ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI). These tests can help visualize the extent of the obstruction and evaluate renal function.

Treatment

The treatment of hydronephrosis depends on the underlying cause and the severity of the condition. In mild cases, monitoring with follow-up imaging may be sufficient. In more severe cases, interventions such as percutaneous nephrostomy, endopyelotomy, or even surgical intervention may be necessary.

Conclusion

Hydronephrosis due to an obstruction at the ureteropelvic junction is a significant clinical entity that requires prompt diagnosis and appropriate management to prevent long-term complications such as renal impairment.

References


Keywords: Hydronephrosis, Ureteropelvic Junction, Obstruction, Diagnosis, Treatment.
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ABSTRACT
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The use and impact of transesophageal echocardiography (TEE) have expanded over the past several
decades. As a result of this evolution, the role of TEE has also evolved. TEE's use in non-cardiac surgery and critical care is
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environment and its applications in the critical care setting.

Keywords:
TEE, non-cardiac surgery, critical care

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Transseptal Puncture

- Imaging Guidance
- Procedure Specific Site Selection
- Procedural Navigation
- Complications

MitraClip®
Watchman® Device
Valve in Valve
LA Perforation
PV Stents
Paravalvular Leak
Goal

To SAFELY Traverse the Inter-Atrial Septum through the Fossa Ovalis from RA to LA without going through the extra-cardiac space.

In majority of the cases it can be achieved by fluoroscopy alone.

Complexity of intervention requires precision in puncture.

Procedure Specific Transseptal Puncture
Embryology & Anatomy
The Importance of Attitudinally Appropriate Description of Cardiac Anatomy

Robert V. Anderson* and Marios Loukas


1. The heart is described as being in attitudinally appropriate position when the patient is lying supine and the right shoulder near the top of the chest radiograph. This position allows a horizontal alignment of the cardiac silhouette with the patient’s right shoulder. The vertical axis of the heart is aligned with the midline of the chest, and the superior and inferior borders of the heart are positioned parallel to the top and bottom of the chest radiograph, respectively.

2. The cardiac silhouette is the outline of the heart as seen on a chest radiograph. It is formed by the outline of the cardiac chambers and the great vessels. The cardiac silhouette is often divided into anterior and posterior portions, with the anterior portion being closer to the skin and the posterior portion being more distant.

3. The mitral valve is seen in the anterior interventricular groove. The papillary muscles supporting the tendinous cords are visible in this view. The mitral valve is typically viewed in the aortic valve plane, with the left ventricle being anterior and interventricular. Such a change has major clinical significance, since it allows for a more accurate assessment of cardiac chamber sizes and shapes.

4. The right heart chambers are positioned anteriorly relative to the so-called left counterpoint. This is an important consideration in the evaluation of cardiac anatomy, as the right heart chambers are often obscured by overlying structures.

5. The right atrium is located within the chest, and the right ventricle is positioned anterior to the right atrium. The pulmonary arteries run horizontally along the diaphragmatic surface of the heart. The inferior caval vein is said to progress in an anterior fashion. A posteromedial approach is used to approach the heart, with the posteromedial border being the most posterior aspect of the heart.

6. The coronary arteries are named and labeled appropriately as shown in Figure 5. When traced towards the cardiac apex, the right coronary artery runs horizontally along the diaphragmatic surface of the heart. The left coronary artery descends along the left border of the cardiac silhouette.

7. The aorta is posterior and descending, with the anterior interventricular groove being posterior and interventricular. Such a change has major clinical significance, since it allows for a more accurate assessment of cardiac chamber sizes and shapes.

8. The aorta is usually being described in the setting of the heart removed from the body, and within the body as viewed in the so-called anatomic position. This important distinction is crucial in the evaluation of cardiac anatomy, with the anatomic position being the position of the heart as seen within the body.

9. Attitudinally appropriate terminology is recommended to avoid problems caused by current anatomic descriptions. Those teaching cardiac anatomy in the classroom have recommended use of attitudinally appropriate terminology to avoid these problems. We suggest that those teaching cardiac anatomy in the classroom adopt this terminology.

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Fossa Ovalis - Anterior and Posterior Rims
**Echocardiographic Guidance**

- Understanding of the nomenclature
- Procedure
- Anatomical Peculiarities
- Communication

**Echocardiographic Guidance**

- Two-dimensional Imaging
- Three-Dimensional Imaging
- Simultaneous Orthogonal Imaging
  - “Live” Narrow Sector Mode
  - “Live” Wide Angle Mode
Steps of the Procedure

Description of the Inter-Atrial Septum

Procedure specific site selection

Tracking the wire

Confirmation of site

Tenting

Puncture
Septal Puncture Location?

More Anterior than Posterior

Infra-Septal - OK
Septal Puncture Site and Distance from Mitral Annulus

Four centimeter circle

Introduction of the Sheath
Final Thoughts

3D Echocardiographic Guidance is Integral to a Safe Transseptal Puncture

Common Nomenclature

Simultaneous Orthogonal Plane Imaging MORE useful than rendered 3D imaging