

SPR 2013 Interventional Session
May 18, 2013
SAM Questionnaire

Renal Artery Denervation for Hypertension

Sam Stuart, FRCR

1. Regarding trans-arterial sympathetic renal denervation

- A. Has been widely used to treat hypertension in children
- B. Is an open surgical technique
- C. Is usually a pain free procedure
- D. Low power radiofrequency ablations are performed
- E. Results in small areas of heat induced damage in the renal parenchyma

Correct Answer: D

References

1. Lancet. 2009 Apr 11; 373(9671): 1275-81. Catheter-based renal sympathetic denervation for resistant hypertension: a multicentre safety and proof-of-principle cohort study.
2. Lancet 2010; 376(9756): 1903-09. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial.
3. Rippey MK, Zarins D, Barman NC. Catheter-based renal sympathetic denervation: chronic preclinical evidence for renal artery safety. Clin Res Cardiol 2011;100: 1095-101.
5. Symplicity HTN-1 Investigators. Catheter-based renal sympathetic denervation for resistant hypertension: durability of blood pressure reduction out to 24 months. Hypertension 2011;57:911-7.
6. Flynn J. The changing face of pediatric hypertension in the era of the childhood obesity epidemic. Pediatr Nephrol. Nov, 2012. DOI 10.1007/s00467-012-2344-0

2. Which one of the following is true regarding the Symplicity HTN-1 trial

- A. Patients were randomized to treatment or non-treatment
- B. All patients responded with a SBP drop of >10mmHg
- C. BP drop in some patients persisted at 24 months
- D. All BP measurements were ambulatory
- E. Patients could not have changed medication post treatment

Correct Answer: C

Reference

1. Lancet. 2009 Apr 11; 373(9671): 1275-81. Catheter-based renal sympathetic denervation for resistant hypertension: a multicentre safety and proof-of-principle cohort study.

3. Which one of the following is true regarding the Symplicity HTN-2 trial?

- A. White coat hypertension was strictly excluded
- B. Secondary causes of hypertension were strictly excluded
- C. Over 100 patients in treatment arm
- D. Ambulatory BP measurement at 6m was the primary endpoint
- E. No cases of renal artery dissection occurred

Correct Answer: E

References

1. Lancet 2010; 376(9756): 1903-09. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial.

Advances in Musculoskeletal Intervention

Neil D. Johnson, MBBS and William E. Shiels, DO

4. Regarding aneurysmal bone cysts, which is true?

- A. Occur uncommonly in and around the pelvis
- B. Is most likely a neoplasm with defined Oncogene Translocations
- C. Recurrence rate for traditional open surgical treatment is less than 10%
- D. Almost never occur in association with other bone lesions
- E. Usually considered as in the same spectrum as Unicameral Bone Cyst

Correct Answer: B

References

1. Panoutsakopoulos G, Pandis N, Kyriazoglou I, Gustafson P, Mertens F, Mandahl N. Recurrent t(16;17)(q22;p13) in aneurysmal bone cysts. *Genes Chromosomes Cancer*. 1999;26:265-266.
2. Ye Y, Pringle LM, Lau AW, Riquelme DN, Wang H, Jiang T, Lev D, Welman A, Blobel GA, Oliveira AM, Chou MM. TRE17/USP6 oncogene translocated in aneurysmal bone cyst induces matrix metalloproteinase production via activation of NF- κ B. *Oncogene*. 2010;29:3619-3629.
3. Greenspan, A. *Orthopedic Imaging: A Practical Approach*, 4th Edition Chapter 20, 2004. Lippincott Williams and Wilkins
4. Dormans JP, Hanna BG, Johnston DR, Khurana JS. Surgical treatment and recurrence rate of aneurysmal bone cysts in children. *Clin Orthop Relat Res*. 2004;421:205-211.
5. Freiberg AA, Loder RT, Heidelberger KP, Hensinger RN. Aneurysmal bone cysts in young children. *J Pediatr Orthop*. 1994;14:86-91.
6. Cohen J. Etiology of Simple Bone Cyst *J Bone and Joint Surgery*, 1970. 52(7) 1493-1497

5. Regarding Langerhans Cell Histiocytosis (LCH), which is TRUE?

- A. Occurs only in Skull, Long Bones and Lumbar Vertebrae
- B. The specific antigen causing the Langerhans Cell proliferation has recently been identified
- C. LCH lesions, including solitary bone lesions always require chemotherapy
- D. Approximately 70 -80% of all childhood LCH presents as bone lesions, often solitary
- E. Is a form of leukemia

Correct Answer: D

References

1. Azouz, Saigal, et al. Langerhans' cell histiocytosis: pathology, imaging and treatment of skeletal involvement. *Pediatr Radiol* (2005) 35: 103–115.
2. Stull MA, Kransdorf MJ, Devaney KO (1992) Langerhans cell histiocytosis of bone. *Radiographics* 12:801-823
3. Key SJ, O'Brien CJ, Silvester KC, et al (2004) Eosinophilic granuloma: resolution of maxillofacial bony lesions following minimal intervention. Report of three cases and a review of the literature. *J Craniomaxillofac Surg* 32:170–175
4. Cohen M, Zornoza J, Cangir A, et al (1980) Direct injection of methylprednisolone sodium succinate in the treatment of solitary eosinophilic granuloma of bone: a report of 9 cases. *Radiology* 136:289–293

Intravascular Ultrasound and Optical Coherence Tomography

Clare A. McLaren, DCR(R)

6. Regarding the use of intravascular ultrasound (IVUS) in arteries:

- A. A transducer frequency of 10 to 15 MHz is usually used
- B. IVUS requires the use of a 6 Fr or larger arterial sheath
- C. IVUS provides poor information on arterial wall thickness
- D. IVUS can currently be used in children who weigh <15 kg
- E. It is necessary to clear the artery of blood during image acquisition

Correct Answer: C

References

1. Dent CL, Canter CE, Hirsch R, Balzer DT. Transplant coronary artery disease in pediatric heart transplant recipients. *J Heart Lung Transplant*. 2000 Mar;19(3):240-8.
2. Forauer AR, Gemmete JJ, Dasika NL, Cho KJ, Williams DM. Intravascular ultrasound in the diagnosis and treatment of iliac vein compression (May-Thurner) syndrome. *J Vasc Interv Radiol*. 2002 May;13(5):523-7.
3. Ino T, Kishiro M, Okubo M, Akimoto K, Nishimoto K, Yabuta K, et al. Dilatation mechanism of balloon angioplasty in children: assessment by angiography and intravascular ultrasound. *Cardiovasc Intervent Radiol*. 1998 Mar-Apr;21(2):102-8.

7. Optical coherence tomography:

- A. Is better than IVUS for the detection of poor stent-wall apposition in renal arteries.
- B. Is not as good as IVUS for detection of neointimal hyperplasia in coronary artery stents than OCT.
- C. OCT uses near ultraviolet light to create images.
- D. A guiding catheter is not required when performing arterial OCT.
- E. Cannot be used in the ureter.

Correct Answer: A

References

1. Negi SI, Rosales O. The role of intravascular optical coherence tomography in peripheral percutaneous interventions. *J Invasive Cardiol.* 2013 Mar;25(3):E51-3.
2. Bezerra HG, Attizzani GF, Sirbu V, Musumeci G, Lortkipanidze N, Fujino Y, et al. Optical coherence tomography versus intravascular ultrasound to evaluate coronary artery disease and percutaneous coronary intervention. *JACC Cardiovasc Interv.* 2013 Mar;6(3):228-36.
3. Given CA, 2nd, Attizzani GF, Jones MR, Ramsey CN, 3rd, Brooks WH, Costa MA, et al. Frequency-Domain Optical Coherence Tomography Assessment of Human Carotid Atherosclerosis Using Saline Flush for Blood Clearance without Balloon Occlusion. *AJNR Am J Neuroradiol.* 2013 Feb 14.
4. Wang H, Kang W, Zhu H, MacLennan G, Rollins AM. Three-dimensional imaging of ureter with endoscopic optical coherence tomography. *Urology.* 2011 May;77(5):1254-8.

Vein of Galen Malformations

David J.E. Lord, MD, FRANZCR

8. Regarding the cause of hydrocephalus in neonates with a vein of Galen aneurysmal malformation, which is true?

- A. Pressure on the aqueduct of Silvius by the dilated vein
- B. Increased flow to the choroid from the posterior choroidal arteries
- C. Venous hypertension and hydrovenous disease
- D. Aqueduct ischemia
- E. Intraventricular hemorrhage

Correct Answer: C

References

1. Michel Zerah, Ricardo Garcia-Monaco, Georges Rodesch, et al. Hydrodynamics in vein of Galen malformations. *Childs Nerv Syst* **8**, 111–117 (1992).
2. McSweeney, N. et al. Management and outcome of vein of Galen malformation. *Archives of Disease in Childhood* **95**, 903–909 (2010).
3. Lasjaunias, P. L. Ter Brugge K, Berenstein A *Surgical Neuroangiography: Vol. 3: Clinical and Interventional Aspects in Children.* Springer (2007)
4. Seidenwurm, D., Berenstein, A., Hyman, A. & Kowalski, H. Vein of Galen malformation: correlation of clinical presentation, arteriography, and MR imaging. *American Journal of Neuroradiology* **12**, 347–354 (1991).

9. Regarding embolization in vein of Galen aneurysmal malformation, which of the following is true?

- A. N Butyl cyanoacrylate is contraindicated as an embolic agent
- B. All affected children should have a trial of embolization
- C. Embolisation should only be attempted after ventricular shunting
- D. Coil embolization of the venous sac is the preferred approach
- E. Transarterial embolization offers the greatest chance of cure

Correct Answer: E

References

1. McSweeney, N. *et al.* Management and outcome of vein of Galen malformation. *Archives of Disease in Childhood* **95**, 903–909 (2010).
2. Lasjaunias, P. *et al.* Vein of Galen malformation. *Childs Nerv Syst* **7**, 360–367 (1991).
3. Johnston, I. H., Whittle, I. R., Besser, M. & Morgan, M. K. Vein of Galen Malformation: Diagnosis and Management. *Neurosurgery* **20**, 747 (1987).
4. Friedman, D. M., Madrid, M., Berenstein, A., Choi, I. S. & Wisoff, J. H. Neonatal Vein of Galen Malformations: Experience in Developing a Multidisciplinary Approach Using an Embolization Treatment Protocol. *Clinical Pediatrics* **30**, 621–629 (1991).

Vascular Malformation Syndromes

Ahmad I. Alomari, MD

10. Which one of the following is not seen in patients with CLOVES syndrome?

- A. Truncal fatty overgrowth
- B. Scoliosis
- C. Complex paraspinal overgrowth with vascular anomalies
- D. Marginal venous system
- E. Connective tissue nevus.

Correct Answer: E

11. Klippel-Trenaunay syndrome and Parkes Weber syndrome share one of these common features:

- A. Hypervascularity
- B. Bilateral distribution
- C. Lower limb involvement
- D. Marginal venous system
- E. Large AV fistulas

Correct Answer: C

References

1. Alomari AI. 2009. Characterization of a distinct syndrome that associates complex truncal overgrowth, vascular, and acral anomalies: a descriptive study of 18 cases of CLOVES syndrome. *Clinical Dysmorphology* 18:1-7.
2. Sapp JC, Turner JT, van de Kamp JM, van Dijk FS, Lowry RB, Biesecker LG. 2007.
3. Newly delineated syndrome of congenital lipomatous overgrowth, vascular malformations, and epidermal nevi (CLOVE syndrome) in seven patients. *Am J Med Genet Part A* 143A: 2944-2958

Interventional Case Club

John M. Racadio, MD

CASE: Combined trans-arterial and percutaneous approach for pre-operative management of Giant Cell Reparative Granuloma

12. What is the diagnosis of an expansile, lytic and multicystic lesion in the mandible based on imaging?

- A. Aneurysmal bone cyst
- B. Ameloblastoma
- C. Giant cell reparative granuloma
- D. Odontogenic cyst
- E. Cannot differentiate between all the above

Correct Answer: E

13. Would you do pre-operative embolization and how would you do it?

- A. No pre-op embolization
- B. Trans-arterial embolization
- C. Percutaneous embolization
- D. Combined trans-arterial and percutaneous embolization.

Correct Answer: D

References

1. Preoperative embolization of primary spinal aneurysmal bone cysts by directed percutaneous intralesional injection of n-Butyl-2-cyanoacrylate. Pearl M.S., M.D. et al. *J Vasc Interv Radiol* 2012; 23:841-845
2. Primary aneurysmal bone cysts in children: percutaneous sclerotherapy with absolute alcohol and proposal of vascular classification. Lambot-Juhan K., M.D. et al. *Pediatr Radiol* (2012) 42:599-605
3. Sclerotherapy in aneurysmal bone cysts in children: a review of 17 cases. Dubois J., M.D. et al. *Pediatr Radiol* (2003) 33: 365-372
4. From the archives of AFIP. Imaging of giant cell tumor and giant cell reparative granuloma of bone: Radiologic-Pathologic correlation. Murphey M.D., M.D. et al. *RadioGraphics* 2001; 21:1283-1309

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6. Giant cell granuloma of the jaws: A Clinical study of 17 cases and a review of the literature. Triantafillidou K., M.D. et al. *Annals of Otolaryngology, Rhinology & Laryngology* 120 (3): 167-174

CASE: Transrectal Abscess Drainage and Adjunct tPA

14. What is true regarding intra-cavitary tPA as abscess drainage adjuvant?

- A. There is a high increased risk of bleeding.
- B. tPA may have no substantial systemic effects because it has a high molecular weight and is slowly released from the peritoneal cavity.
- C. A high dose of tPA is instilled for intra-cavitary treatment of abscess refractory to drainage.
- D. Intra-cavitary tPA can not be used in patients receiving systemic anticoagulation.

Correct Answer: B

References

1. Risk factors for the development of abdominal abscess following operation for perforated appendicitis in children: A multicenter case control study. Marion C. W. Henry; Angela Walker; Bonnie L. Silverman; et al *Arch Surg.* 2007;142(3):236-241. doi:10.1001/archsurg.142.3.236.
2. Complex Abdominal and Pelvic Abscesses: Efficacy of Adjunctive Tissue-Type Plasminogen Activator for Drainage. M Beland, D Gervais, et al. *Radiology.* 2008; 247(2):567-573
3. Randomized Prospective Comparison of Alteplase versus saline solution for the percutaneous treatment of loculated abdominopelvic Abscesses. D. Cheng, K.T. Nagata et al. *J vasc Interv Radiol* 2008;19:906-911
4. Tissue plasminogen activator for the treatment of intraabdominal abscesses in a neonate. IR Diamond, PW Wales, et al. *J Pediatric Surg* 2003 38:1234-1236

CASE: Renal Artery Stenosis

15. Renal artery stenosis in children without systemic disorders is most common in:

- A. Main renal artery
- B. 2nd or 3rd order renal vessels
- C. None of the above
- D. Aorta

Correct Answer: B

Reference

1. Pediatric Radiology October 2006, Volume 36, Issue 10, pp 1032-1036; Anatomic distribution of renal artery stenosis in children: implications for imaging; Nghia J. Vo, Ben D. Hammelman, Judy M. Racadio, C. Frederic Strife, Neil D. Johnson, John M. Racadio