ENDOVASCULAR REPAIR OF TRAUMATIC INFRARENAL AORTIC INJURY IN AN 8-YEAR OLD

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Background

- Pediatric blunt infrarenal aortic injury is a morbid and potentially fatal problem rarely described in the literature
- Surgical approach to this problem has primarily consisted of open repair[1,2]
- This clinical scenario poses multiple challenges given vessel diameter and ongoing patient growth
- Long-term outcomes in these patients have not been reported[2,3]
- Endovascular intervention in the pediatric population is seldomly used[3]

Patient Presentation

PRESENTATION

- 8-year-old male presenting to outside facility following high-velocity motor vehicle collision in which he was a restrained passenger
- CT imaging demonstrated extensive pneumoperitoneum and 1.5cm infrarenal pseudoaneurysm with contained retroperitoneal hematoma
- Patient underwent damage-control laparotomy with small bowel resection. Abdomen was temporarily closed.
- Patient transferred to tertiary care Pediatric Hospital
- Additional injuries included open tibial/fibular and unstable L2 vertebral body fractures
- Patient intubated, sedated, and hemodynamically labile. Distal extremity pulses were appreciable with doppler
- Vascular surgery was consulted and imaging reviewed
- Decision was made for urgent operative intervention. An endovascular approach was favored given recent intra-abdominal contamination and labile hemodynamic status

Imaging

Figure 1a

Figure 1b

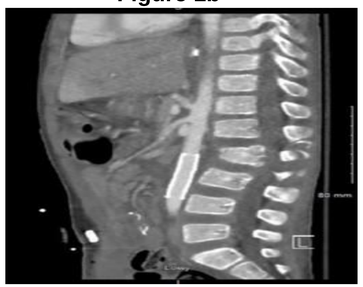

Figure 1a (left): Sagittal view of CT demonstrating infrarenal aortic injury *Figure 1b (right)*: Post-operative CT angiogram demonstrating stent placement across injured aortic segment

Figure 2a

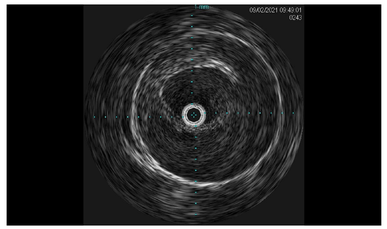

Figure 2b

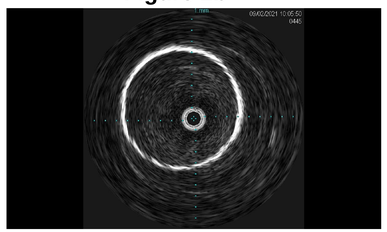

Figure 2a (left): IVUS demonstrating aortic disruption *Figure 2b (Right)*: IVUS imaging obtained post-stent placement

Figure 3a

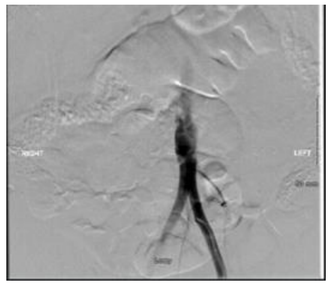

Figure 3b

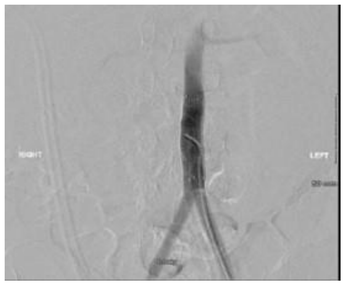

Figure 3a (left): Intra-operative angiography confirming aortic injury *Figure 3b (Right)*: Intra-operative angiography following stent placement across aortic injury

Management and Clinical Course

PROCEDURE DESCRIPTION

- Access obtained via left femoral artery cutdown
- Aortogram performed demonstrating area of infrarenal aortic disruption
- Injury location confirmed with intravascular ultrasound (IVUS)
- 11mm x 5cm Viabahn stent was placed across the injury
- Adequate proximal and distal seal was obtained following dilation with a 10mm balloon
- Final angiography confirmed stent placement
- Arteriotomy closed primarily with a 6-0 prolene suture
- Dopplerable distal pulses at conclusion of the case

POST-OPERATIVE COURSE

- Patient underwent definitive repair of his other traumatic injuries
- Neurovascular exam intact at 1 and 6 month follow-up
- Surveillance CT angiogram obtained demonstrating patent stent with appropriate positioning

Discussion

- The presented case demonstrates an endovascular approach to repairing traumatic infrarenal aortic injury
- Open repair was felt to be a less suitable option in this patient given his concomitant bowel injury and hemodynamic status
- Patient will require definitive open repair of his aortic injury in the future once he matures

References

1. Kim S, Modrall JG, Malekpour F, et al. A single-center experience on the management of Pediatric Blunt Aortic Injury. Journal of Vascular Surgery. 2022;75(5):1570-1576. doi:10.1016/j.jvs.2021.12.067
2. Mangold M, Chaves JM, Blewett C, Williams M. Infrarenal aortic dissection in a child after blunt trauma. Journal of Vascular Surgery Cases, Innovations and Techniques. 2022;8(2):129-131. doi:10.1016/j.jvscit.2022.01.002
3. Sadaghianloo N, Jean-Baptiste E, Breaud J, Declemy S, Kurzenne J-Y, Hassen-Khodja R. Blunt abdominal aortic trauma in paediatric patients. Injury. 2014;45(1):183-191. doi:10.1016/j.injury.2012.10.033