

Open Surgical Care of Children Less Than 13 Years of Age with Vascular Injury: Problems and Precautions

NOTES

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Pediatric vascular trauma is rare accounting for only about 1% of childhood trauma admissions with the etiology age dependent, iatrogenic injury predominates under the age of 2 years, whereas penetrating injury abounds in the teenage years.¹ The middle years can experience significant blunt (30-40%) and therefore hidden injuries with the risk of end-organ loss.² This age group in particular, can experience falls, bicycle-related injury, and small watercraft trauma. A recent study from our center concentrated on the latter group of children.

Query of our vascular surgery database for a 7-year period ending in 2002 was performed to determine those children less than 13 years of age requiring vascular interventions. Patient demographics, presentation, etiology, surgical specifics, and outcome were sought.

Ten children (2 female, 8 male) with median age 7.4 years (range 2-11.5 years) were found. The etiology was 4 blunt, 4 iatrogenic, and 2 penetrating injuries, often with associated injuries. There was one axillary artery, 3 abdominal vascular, and 6 lower extremity vascular injuries. In the latter group, there was a delay in diagnosis in 3 cases. Hypogastric artery was used to repair intraabdominal arterial injuries. Five reverse vein bypasses (4 greater saphenous) and 1 vein patch repair of a pseudoaneurysm (2 year old) were used for repair of the extremity injury. Generally, 7-9'0' interrupted Prolene suture with systemic heparinization and meticulous surgical technique allowed repair. A delay in diagnosis resulted in 1 primary major amputation, 1 delayed major amputation, and 1 insensate but functional lower extremity. An associated brain injury resulted in the only mortality and the 1 primary amputation. All other bypasses are functioning (follow-up 3 months-8 years) with viable end organs. Possibly most interesting is the fact that 3 reverse greater saphenous vein bypass grafts of significant length required to salvage the lower extremity in children 7.8 to 9.2 years of age are functioning without dilation or occlusion for a mean of 35.6 months.³ Another group has reported on the long-term results of lower extremity bypass grafts performed in children. One graft demonstrated mild dilation (< 50%) at 23.7 years, whereas 2 others were normal at 11.8 and 26.1 years.⁴

Conclusion

This study has confirmed that vascular blunt injury is especially insidious in these injured children and can result in significant diagnostic delays. However, if found and treated early in the course of the injury, the majority of vascular trauma can be successfully repaired and even extensive bypasses with reverse vein will allow limb salvage in the absence of a diagnostic delay. An aggressive approach to vascular injury in children seems warranted.

References

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