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Current state of mechanical support therapies for heart failure in pediatrics: Developments and missing links

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It is estimated that in the North America alone, there are 25,000 pediatric hospitalizations every year for heart failure. This number is growing rapidly. As more and more complex congenital heart disease patients survive, the heart failure burden continues to rise. The morbidity, mortality and cost associated with caring for these patients are extremely high. Heart transplantation is currently the only viable therapy for end stage heart failure. However, the donor pool has been static or shrinking in the developed countries. Additionally, the demands of post-transplant management are tremendous. Alternate management strategies and bridging strategies using mechanical support are therefore rapidly gaining ground. There are unique challenges in pediatric patients including anatomic, surgical, hematological, growth and life style associated issues. This talk will review the current state of art strategies for mechanical support in pediatrics, how it pertains to world wide applications and interests as well as focus on where the biomedical engineering field needs to advance.

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Management of pediatric perforated appendicitis: Comparing outcomes using early appendectomy vs. solely medical management

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Background: There is controversy regarding whether children with perforated appendicitis should receive early appendectomy [EA] vs. medical management [MM] with antibiotics and delayed interval appendectomy.

Objective: To compare outcomes of children with perforated appendicitis who receive EA vs. MM.

Methods: Case review of consecutive children aged <18 years with perforated appendicitis who received either EA or MM during an 8-year period. Criteria for hospital discharge included patient being afebrile for at least 24 hours, pain-free and able to tolerate oral intake.

Results: Of 203 patients diagnosed with perforated appendicitis, 122 received EA and 81 MM. All received parenteral antibiotic therapy initiated in the ED and continued during hospitalization. There were no significant differences between groups in mean patient age, mean CBC total WBC count, gender distribution, rates of ED fever, or rates of intra-abdominal infection [abscess or phlegmon] identified on admission. Compared to patients receiving MM, those receiving EA experienced significantly fewer: 1] days of hospitalization, parenteral antibiotic therapy and in-hospital fever; 2] radiographic studies, percutaneous drainage [PD] procedures and placement of central venous catheters performed; 3] post-admission intra-abdominal complications; and 4] unscheduled repeat hospitalizations after hospital discharge. Only 1 EA-managed patient developed a post-operative wound infection.

Conclusions: Children with perforated appendicitis who receive EA experience significantly less morbidity and complications vs. those receiving MM. The theoretical concern for enhanced morbidity associated with EA management of perforated appendicitis is not supported by our analysis.

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