The utility of intra-operative peritoneal cultures during appendectomy for complicated appendicitis

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Background: Obtaining peritoneal fluid cultures at the time of appendectomy is an uncommon practice. Due to a high organ space infection (OSI) rate for complicated appendicitis (CA), we implemented a care bundle that included obtaining intraoperative cultures, hypothesizing that the data gathered would help tailor antibiotic choice and reduce post-operative OSI.

Methods: The bundle (intervention) implemented for CA included administration of parenteral piperacillin/tazobactam (given minimum of 72 hours post-operatively), obtaining intra-operative peritoneal fluid cultures, and using culture data to tailor in-hospital parenteral and discharge oral antibiotics. We compared outcomes to a pre-intervention cohort who empirically received post-operative piperacillin/tazobactam, with no specific minimum duration of therapy, and amoxicillin/clavulanate at discharge.

Results: During the fifteen month pre-intervention period, sixty-six children underwent appendectomy for CA compared to 39 patients in 9 months post-intervention. None of the pre-intervention patients had intraoperative cultures compared to 95% of the post-intervention patients. Culture results altered the choice of oral antibiotics in 14 of 37 patients (38%): 8 *Pseudomonas*, 5 multi drug-resistant *E. coli*, and 1 *Citrobacter*. In comparing the two time periods, we saw a trend towards decreased post-operative OSI (25.4% pre versus 10.2% post, p=0.056, Figure). All-cause morbidity (surgical site infection, emergency department visit, or readmission to hospital) decreased significantly from 33.3% to was 10.2% (p=0.008). Post-intervention there were no readmissions; all patients who had an OSI were diagnosed before discharge. Despite a mandatory minimum duration of 72 hours of postoperative parenteral antibiotics, the median length of stay (5 vs 4 days, p=0.30) was statistically unchanged.

Conclusions: Obtaining peritoneal fluid cultures changed antibiotic therapy in 38% of patients with CA. Utilization of a care bundle for CA that included peritoneal culture was associated with improved outcomes without prolonging hospital length of stay. This simple strategy improves antibiotic stewardship and may decrease post-operative morbidity in children with CA.

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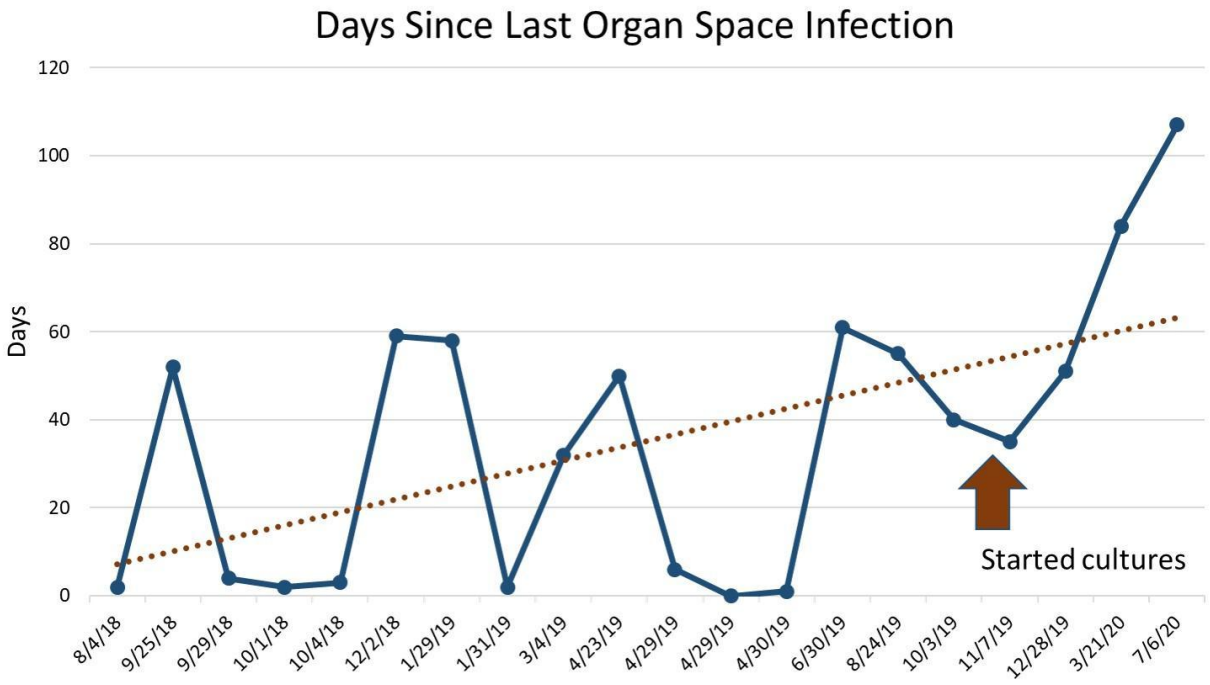
Figure



The solid blue line indicates days since last organ space infection (OSI) after appendectomy for complicated appendicitis. The x-axis shows the date of appendectomy for a patient who had a post-operative OSI. The y-axis shows the number of days since the prior case of appendectomy complicated by OSI. The trend is denoted by the dotted line.