



How to optimize antibiotic prophylaxis in percutaneous kidney stone surgery?

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Comment on: Paonessa JE, Gnessin E, Bhojani N, *et al.* Preoperative Bladder Urine Culture as a Predictor of Intraoperative Stone Culture Results: Clinical Implications and Relationship to Stone Composition. *J Urol* 2016;196:769-74.

Received: 01 March 2017; Accepted: 11 March 2017; Published: 30 March 2017.

doi: 10.21037/amj.2017.03.09

View this article at: <http://dx.doi.org/10.21037/amj.2017.03.09>

Percutaneous nephrolithotomy (PCNL) is the gold standard treatment for large renal calculi (1). Post-PCNL urosepsis is a rare (0.3% to 5%) but life threatening complication and the most common cause of death in patients undergoing PCNL (2,3). Antibiotics according to previous microbiology results are usually administered pre- and/or intraoperatively in order to prevent infectious complications.

In the referred article Paonessa *et al.* (4) examined the correlation between urine and stone cultures in 776 patients treated with PCNL. In 349 patients (45%) both cultures were negative, while in 225 patients (29%) both urine and stone cultures were positive. A positive urine culture but negative stone culture was observed in 127 patients (16%), a negative urine culture but positive stone culture in 75 patients (10%). Interestingly, in the group with positive urine and stone culture (n=225) different microbes were isolated in up to 46%, while the same microbes were identified in both cultures in only 54%. Overall, in 13% of patients (103/776) discordant microbes were isolated in the two different cultures. Based on these data, a 62% sensitivity and 60% specificity was calculated for the urine culture to predict the correct microbes in the stone culture. Urosepsis was observed in 13/776 patients (1.7%); 9 of these 13 patients (69%) revealed a discordance between urine and stone cultures. In addition, the culture results were set into relationship to the stone composition. As expected, patients with struvite and/or carbonate apatite stones (some call these 'infectious' stones) revealed more often positive urine and stone cultures than metabolic stone formers (79% and 70% vs. 39% and 33%, respectively).

The poor relation between positive urine and stone culture is of particular interest with regard to the treatment of post-PCNL sepsis. The authors state that in their series almost 70% of septic patients had different microbes isolated in the urine compared to the stone culture. Notably, the definition of discordance of cultures was rather strict as it was considered discordant if any pathogen was cultured in the stone that was not cultured in the urine. Still, the presented numbers are worrisome. Additional information about the resistograms, however, would be interesting in order to calculate the number of patients who have been treated with inappropriate antibiotics due to misleading results of the urine culture (in absence of a stone culture result).

Interestingly, only 1/13 (8%) patient with urosepsis had a struvite stone while 12/13 (92%) were metabolic stone formers. This is an important information because PCNL in metabolic stone formers is not considered a high-risk intervention for postoperative urosepsis in contrast to patients who have 'infectious' stone material.

Another important observation is the presence of candida in 12% of all stone cultures. This might be specific for the present cohort of a tertiary referral center; however, it might also be a common phenomenon of patients who receive multiple and long-lasting antibiotic treatments before PCNL. Thus, active fungal analysis should be performed in case of urosepsis after percutaneous surgery.

Interestingly, enterococcus spec. was cultured in 41/300 (14%) patients with a positive stone culture. This is of particular interest as an enterococcus is often not

sufficiently treated with antibiotics typically administered before surgery.

Taking together, the above presented arguments, the potentially life threatening complication of urosepsis after PCNL and the relatively low cost of a single culture argue for the authors' recommendation to perform routine stone cultures in addition to routine urine cultures. Moreover, targeted antibacterial therapies might also help to reduce increasing antibiotic resistance.

Acknowledgements

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned and reviewed by Section Editor Xiao Li (The Affiliated Cancer Hospital of Jiangsu Province of Nanjing Medical University, Nanjing, China).

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/amj.2017.03.09>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

doi: 10.21037/amj.2017.03.09

Cite this article as: Roth B, Moltzahn F. How to optimize antibiotic prophylaxis in percutaneous kidney stone surgery? AME Med J 2017;2:37.

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References

1. Türk C, Petřík A, Sarica K, et al. EAU Guidelines on Interventional Treatment for Urolithiasis. *Eur Urol* 2016;69:475-82.
2. de la Rosette J, Assimos D, Desai M, et al. The Clinical Research Office of the Endourological Society Percutaneous Nephrolithotomy Global Study: indications, complications, and outcomes in 5803 patients. *J Endourol* 2011;25:11-7.
3. Lai WS, Assimos D. The Role of Antibiotic Prophylaxis in Percutaneous Nephrolithotomy. *Rev Urol* 2016;18:10-4.
4. Paonessa JE, Gnessin E, Bhojani N, et al. Preoperative Bladder Urine Culture as a Predictor of Intraoperative Stone Culture Results: Clinical Implications and Relationship to Stone Composition. *J Urol* 2016;196:769-74.