The Routine Use and Cost Analysis of Acid-Fast Bacilli and Fungal Cultures in Foot & Ankle Surgery: A Retrospective Study

Margaret Bohr, B.S.[1], Robert Dean, M.D.[2], Zein El-Zein, M.D.[2], Megan Audet, M.D.[2], Paul Fortin, M.D.[2], Zachary Vaupel, M.D.[2]

OAKLAND UNIVERSITY WILLIAM BEAUMONT

[1]Oakland University William Beaumont School of Medicine, Rochester, MI

[2]Department of Orthopaedic Surgery Beaumont Health, Royal Oak, MI

Introduction

- Infections pertaining to orthopaedic surgery play a major role in patient morbidity and increased healthcare-associated expenses.
- In the setting of foot and ankle surgery for infection, it is common practice to send acid-fast bacilli (AFB) and fungal intraoperative cultures, although there is no standard protocol in place.

Aims and Objectives

- To retrospectively assess the incidence and cost of positive AFB and fungal cultures in a consecutive series of foot and ankle surgeries.
- Determine the number of positive AFB and fungal cultures of the total number of foot and ankle samples tested by reviewing past medical records
- Assess the value of ordering AFB and fungal cultures in foot and ankle infections

Methods

- Under an IRB-approved protocol, CPT codes were used to identify 447 procedures in 322 patients, who underwent foot and ankle surgery for infection at a single academic institution from 2014 to 2019.
- A medical records review was performed to collect microbiology and patient demographic data. Materials and labor cost data, which was provided by the institution, was used to quantify a total culture cost.

Results

- There were 185 male and 137 female patients with an average age of 57 years (range, 10-105) and average BMI of 31 kg/m^2 (range, 13-56).
- 434 and 525 samples were taken for AFB and fungal cultures during these procedures.
- No patients had positive AFB and 20 patients (7.5%) had positive fungal cultures.
- There were 0% (0/434) AFB and 5% (26/525) fungal culture positivity rates.
- The total cost for AFB cultures was $23,967. The total labor/materials cost for negative and positive fungal cultures was $12,428 and $2,371, respectively.
- The total labor and materials cost for all cultures over the time frame of our study was $38,767.

Variable	AFB	Fungal
Total # of patients (N=322)	241 (74.8%)	267 (82.9%)
# of patients with positive cultures	0 (0%)	20 (7.5%)
Total number of cultures sent	434	525
# of positive cultures	0 (0%)	26 (4.95%)
Average # of cultures sent per case	1.59	1.66

Table 1. Number of AFB and fungal cultures sent

Variable	Aerobe	Anaerobe
Total # of patients (N=322)	275 (85.4%)	272 (84.4%)
# of patients with positive cultures	195 (70.9%)	82 (30.1%)
Total # of cultures sent	571	561
# of positive cultures	370 (64.8%)	116 (20.7%)
Average # of cultures sent per case	1.68	1.68

Table 2. Number of aerobic and anaerobic cultures sent

Test	Cost for labor and materials per culture	Total Cost for all cultures
Negative AFB Setup	$ 55.22	$ 23,966.93
Positive AFB Setup	$ 273.80	$ 0
Negative Fungus Setup	$ 24.91	$ 12, 428.43
Positive Fungus Setup	$ 88.35	$ 2,371.20
TOTAL:		**$ 38,766.56**

Table 3. Total labor and materials cost

Conclusions

- This study highlighted low rates of positive AFB and fungal cultures in orthopaedic foot and ankle surgery, as well as substantial institutional costs of routine use of intraoperative cultures.
- Given the infrequency of positive AFB and fungal cultures and their associated costs, we believe their routine use is unwarranted.
- With expanding the study to other oprthopaedic subspecialties, we hope to create a protocol on obtaining AFB and fungal cultures only when there is high index of clinical suspicion, high risk patients, and recalcitrant infections.

References

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Acknowledgements

Thank you to all the members of this project for their continued contribution and support.