

## Antibiotic prophylaxis after thoracic drainage: Standard practice or unproven habit?

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### Abstract

**Background:** The prescription of antibiotics after thoracic drainage varies among surgical teams and is often based on local habits rather than evidence.

**Objective:** To assess the necessity and impact of postoperative antibiotic prophylaxis following thoracic drainage in a standardized surgical context.

**Methods:** A retrospective descriptive study including 163 patients who underwent thoracic drainage in a single surgical unit under uniform procedural conditions.

**Results:** 18 patients developed post-drainage infectious complications. No mortality was reported.

**Conclusion:** Antibiotic prophylaxis in thoracic drainage remains controversial and should be considered based on individual patient risk factors and institutional infection profiles.

**Keywords:** Thoracentesis; Thoracic Surgery; Antibiotic Prophylaxis; Infection; Complications

### 1. Introduction

Antibiotic prescription following thoracic procedures is a debated topic, especially when there is no obvious infection. While some surgical interventions clearly warrant prophylaxis, others are more ambiguous. Current practices often reflect institutional habits, practitioner preferences, and local microbial ecology rather than robust clinical evidence. This study aims to evaluate the actual benefit of antibiotic prophylaxis following thoracic drainage in a standardized clinical setting.

### 2. Methods

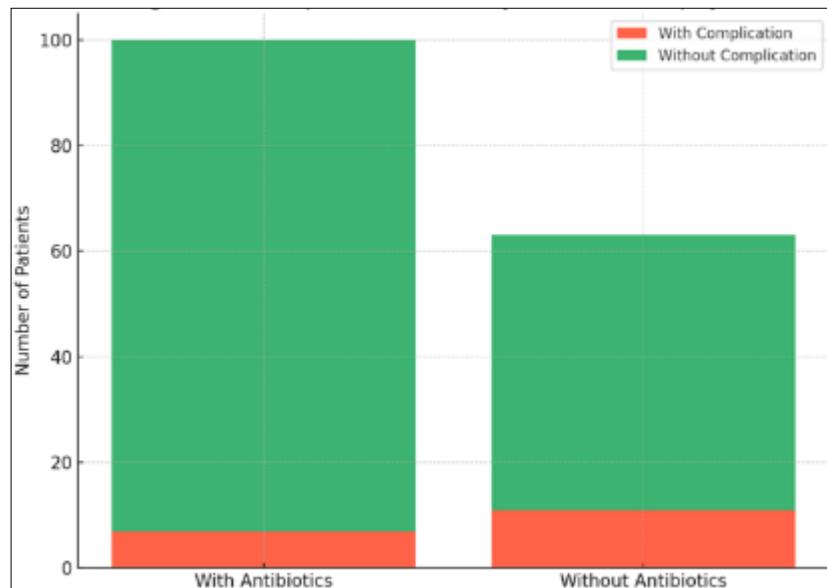
This retrospective, descriptive study was conducted in the thoracic surgery unit of the Regional Hospital of Agadir. We included all patients who underwent thoracic drainage, excluding those with purulent pleurisy or penetrating thoracic trauma cases where antibiotics are systematically administered per protocol.

All procedures were performed by the same surgeon in the same operating room, following identical aseptic protocols. Postoperative follow-up included clinical, radiological, and biological assessments conducted by the same physician and verified by a supervising professor.

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### 3. Results

A total of 163 patients who underwent thoracic drainage were included in this study. Of these, 100 patients received prophylactic antibiotics, while 63 did not. The two groups were comparable in terms of baseline characteristics and the procedures were performed under similar aseptic conditions, by the same surgeon, in the same operating room. Figure 1



**Figure 1** Complication rates by antibiotic prophylaxis

Overall, 18 patients (11%) developed at least one post-drainage complication:

- Homolateral pneumonia occurred in 7 patients: 3 who received antibiotics and 4 who did not.
- Drain site infections were seen in 4 patients (2 in each group).
- Atelectasis occurred in 4 patients, equally distributed across both groups.
- Generalized infection (sepsis) was reported in 5 patients: 3 with antibiotics and 2 without.
- An elevated C-reactive protein (CRP) level without overt clinical infection was noted in 9 cases (5 with antibiotics, 4 without).
- Secondary purulent pleurisy was reported in 4 patients, two in every group groups.

In total, 10 patients in the antibiotic group (10%) and 8 patients in the non- antibiotic group (12.7%) experienced one or more of the complications listed above. No statistically significant difference was observed between the groups regarding infection rates.

Importantly, there were no deaths in either group, and all complications were managed successfully with appropriate follow-up and supportive care. Knowing that the majority of our patients (95%) benefited from daily chest physiotherapy, and routine dressing changes were performed in both groups, which may have contributed to the generally favorable outcomes observed.

### 4. Discussion

In this retrospective study, we aimed to better understand whether routine antibiotic prophylaxis is truly necessary after thoracic drainage in non-infected cases. Among the 163 patients included, those who received antibiotics ( $n = 100$ ) did not show a markedly different rate of postoperative infection compared to those who did not ( $n = 63$ ). Overall, infections were infrequent in both groups, suggesting that systematic use of antibiotics is not significantly impacting outcomes in our context.

Our results echo the findings of recent studies, Dhole et al. (1) emphasized the importance of antibiotic stewardship, warning against the routine use of prophylaxis in clean surgical procedures without clear indication. Instead, they advocate for a more selective approach, taking into account each patient's individual risk factors and the procedural environment.

This perspective is further supported by the Eastern Association for the Surgery of Trauma (EAST) (2,3) guidelines, which recommend antibiotics primarily in penetrating thoracic trauma. For blunt chest trauma, growing evidence including a recent meta-analysis indicates that prophylactic

antibiotics do not significantly reduce the rate of infectious complications. These findings advocate for their use mainly in high-risk situations, such as prolonged drainage or immunocompromised patients.

In our own experience, infectious complications such as pneumonia, site infections, or pleurisy were distributed in both groups, with no clear association to antibiotic use. This reinforces the notion that infection is multifactorial, often linked more to the quality of surgical technique, strict aseptic conditions, appropriate physiotherapy, and patient-specific factors than to antibiotics alone. (1,2,3)

In our Study, no deaths were recorded, and the rate of serious complications is low. This supports a more measured and personalized use of antibiotics rather than a blanket approach. Avoiding unnecessary prescriptions helps reduce antibiotic resistance, limits patient exposure to drug-related side effects, and lowers healthcare costs all without compromising patient safety in low-risk scenarios.

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## 5. Conclusion

Our study highlights that routine antibiotic prophylaxis following thoracic drainage may not be necessary in all cases. In a controlled setting where surgical technique, aseptic conditions, and postoperative care are consistent, the incidence of infectious complications remained low and similar between patients who received antibiotics and those who did not.

These findings support a more selective and individualized approach to antibiotic use, guided by patient risk factors, local microbial ecology, and the quality of perioperative care.

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## Compliance with ethical standards

### *Acknowledgments*

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### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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