

Peer Review File

Article information: <https://dx.doi.org/10.21037/jtd-22-1590>

Reviewer A

The authors have performed an observational retrospective study of 50 consecutive patients with severe necrotizing pneumonia defined as a necrotizing cavity involving at least 50% of a lobe, or smaller multi-lobar cavities. The hypothesis is that standard medical therapy alone can result in a better outcome than a primary surgical approach. In this series, only 4 patients (8%) had decortication surgery, none underwent lung resection, and 4 patients (8%) died. The extent of infiltrates and number of cavities were not associated with mortality, but the extent of infiltrates was associated with risk of intubation ($p=.004$). The authors conclude that their results support avoiding pulmonary resection in patients with severe necrotizing bacterial lung infections. The study supports the conservative approach. However, certain points should be addressed.

Comment 1: This is stated to be a consecutive series, with all treated primarily with a medical approach. It is surprising that there were not more cases using a primary surgical or combined medical and surgical approach. Going back to 2006, was it the policy of your institution to favor a primary medical approach? Were there other cases over the same time frame of 2006-2019 where a primary surgical approach was used and, if so, what were the results?

- Reply: Thank you for your pertinent question. The general approach of the three thoracic surgeons working in our hospital has always been very conservative.
- In 2006, our institution adopted a policy of avoiding major parenchymal resections in necrotizing lung infections because of the potential for major surgical morbidity in the absence of a compelling rationale or any formal guidelines. To clarify this in the text, we have added this previous sentence to the “study design and setting” section (see page 7, line 125).
- Over the time period of our study, 65 patients had a compatible clinic picture and were hospitalized for a cavitating pneumonia but only 50 patients fulfilled our strict inclusion criteria (as described in figure 1).
- The included patients are all consecutive cases treated at our hospital and were the entirety of the cases managed in that time period. No surgical case was excluded prematurely or not taken into consideration for our study (also described in introduction section (see page 6, lines 102-110))

Comment 2: How do your results compare to other studies in which both primary medical and primary surgical cases were included?

- Reply: There is a scarce number of studies that do include both primary

medical and surgical cases. In fact, the vast majority are mentioned in our paper, but few are recent studies that do use contemporary medical management (and are thus comparable to our patients' treatment) :

- The paper from Hirshberg et al (*Chest*, 1999) is the only one that is contemporary and includes medically and (a small proportion of) surgically treated patients
- The paper from Seo et al. (*Respirology*, 2013) is contemporary but reports only medically treated patients (and their main characteristics have been discussed in our paper, please see page 12-13, lines 273-281)
- The paper from DeLarue et al. (*The Canadian Journal of Surgery*, 1980) included medical and surgical cases but reports case from 1926 to 1975, so not comparable.
- The paper from Hagan et al. (*Annals of Surgery*, 1983) also included medical and surgical cases but is probably not recent enough to make appropriate comparison.
- A partial answer to this question can be sought in two sections of the text: at line 268-282 and lines 94-100.
- A more detailed answer can be the following (which could be partly added to the manuscript, if felt necessary):
 - When compared to other previously mentioned medical studies (*Chest* 1999 and *Respirology* 2013), our patients had similar age and rates of COPD, diabetes and neoplasm. They also had higher rates of CKD (3-6% (*Respirology* 2013) vs 24%) and significant alcohol intake (9-18% (*Respirology* 2013) vs 24%). We could not compare our mean CCI value, as we were the first ones to report it. Higher rates of *Staphylococcus aureus* (7-11% vs 38%) and *Streptococcus pneumoniae* (7-13% vs 18%) infections were also seen in our patients. Other bacterial pathogens were identified with similar rates. In the prior medical studies (ref), the RLL was the lobe most commonly affected by a cavitary lesion. In our study, the RUL and RLL were the most affected ones (in 48% of patients respectively) and a substantially greater proportion of the patients had multi-lobar cavities (13-18% vs 42%). Similar cavity diameter sizes were reported. Prior studies did not offer detailed information regarding the clinical severity of the infection. In one study (Resp 2013), the patients had notably low PSI scores (62-66: low clinical risk). Although not calculated in our study, many patients required vasopressors or mechanical ventilation and had empyema. None of these two studies revealed information about ICU stay or need for mechanical ventilation. Of note, the hospitalization length of stay was significantly longer in our study (10-25.7 days [in one study] vs 37.3 days).

Comment 3: The Abstract states that, on imaging, 42% had multilobar cavities and mean cavity diameter was 5.9 cm. So 58% had single cavities? Does the 5.9 cm represent data for single and multiple cavities? Please clarify.

- Reply: Thank you for your comment. We understand the confusion created by

this value. In fact, this is the mean cavity diameter of the biggest cavity in each case (so obviously the diameter of the only cavity in single cavity cases and the diameter of the largest cavity in the cases of multiple cavities)

- We have modified the phrasing in the abstract to reflect this (see page 3, lines 46-47) and the phrasing in table 2 (see page 2, table 2)

Reviewer B

Comment 1: Line 163: Please review the test name, Chapiro or Shapiro?

- Reply: Shapiro is the right word, that was a mistake
- We have modified our text as advised (see page 9, line 176)

Comment 2: Line 182-183: Numbers under 10 is better to write the number, especially at the beginning of the sentence.

- Reply: “4” changed for four
- We have modified our text as advised (see page 9, line 195)

Comment 3: Line 183: I think it is more correct to use the term "bacterial" instead of microbial. Because microbial includes different microscopic organisms, and its study only includes bacteria.

- Reply: Good remark, changed for bacterial
- We have modified our text as advised (see page 9, line 196)

Comment 4: Line 184: “20 patients (40%) had a monobacterial infection...”. At the beginning of the sentence it is preferable to write the numbers with letters.

- Reply: Changed for “twenty”
- We have modified our text as advised (see page 9, line 197)

Comment 5: Line 192: “8 patients (16%) later required tracheostomy.” At the beginning of the sentence, it is preferable to write the numbers with letters

- Reply: Changed for “eight”
- We have modified our text as advised (see page 10, line 210)

Comment 6: Line 193: It seems to me that even if there is low mortality rate, it is necessary to indicate the causes of death of the patients, in order to have an adequate clinical picture.

- Reply: Thank you for your question. We had specifically looked into the cause of death from these 4 patients in the past. We also had written a complete paragraph on that subject, but had deleted it in the version sent to your editor (in order to keep the manuscript as concise as possible).
- We have now added this information again in a separate paragraph in the result section (see pages 10-11, lines 224-243). Please see this section and tell us if this is suitable for you. We could also had a separate table (already made)

summarizing the specific characteristics of these patients (if necessary).

Comment 7: Line 230: Your study compared with much older cohorts with probably different management (less antibiotics, less ventilation / ICU techniques, etc.). I think that it is important to know.

- Reply: Thank you, this is a great remark. This indicates that the text merits some nuancing as this needs to be kept in mind when interpreting the results of our study. Most previous papers on medical cohorts did not specifically report the critical care interventions performed in these patients (as noted at page 13, lines 281-282).
- We have added some precision to the text as advised (see page 12, lines 269-271)

Comment 8: Line 239: “respiratory failure”, why put in quotes? different definitions? Explain it, please.

- Reply: We apologize, this was a mistake. We have the same definition of respiratory failure. Quotes removed.
- We have modified our text as advised (see page 13, line 283)

Comment 9: Ref. 24: remove parentheses

- Reply: Parentheses removed
- We have modified our text as advised (see page 18, lines 417-418)

Comment 10: Table 4, Column 3: What data does this column provide? The IC95 are an estimation technique and you are describing your sample in this table.

- Reply: Yes, good observation. We have removed that column as requested.
- We have modified our text as advised (see page 4, table 4)