

Peer Review File

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Reviewer A

Authors performed a retrospective review of a national database to identify whether HIV patients had higher rates of revision surgery at 2 years after lumbar fusion compared to patients without HIV. They found similar revision rates but overall higher respiratory complications for patients affected with HIV.

Comment 1: Within the limitations of the study, I do not have any major concerns regarding the methods or results except for the tables. The way the data is presented is very confusing. What is exactly being compared? Why are there 3 p-values per row? Are the three groups compared individually to one another? There is no need to add a column for total n and one for %, this can be on the same column.

Reply 1: Thank you for your suggestion. We compared each cohort of patients who were HIV-positive (HIV, asymptomatic HIV, and AIDS) to the control cohort of patients who were HIV-negative. Each column labeled “p-value” represents the p-values for the comparison between the column before it (HIV, Asymptomatic HIV, AIDS) and the control column. These were three separate analyses that have been tabled together. For the multivariable analysis in Table 4 we adjust for the significant comorbidities and demographics in each group and compare each study group to the control cohort to obtain the odds ratios, confidence intervals, and p-values.

Changes in the text 1: We have combined the columns for “n” and “%” into one column in each table per your suggestion (Tables, Page 24-27).

Comment 2: The question is, why is this important to study? The authors themselves cite several papers that have already looked at this same issue. Yes, perhaps not at pseudarthrosis or long term revision for adjacent segment disease, PJK, etc, but then why would an HIV patient have higher rate of revision surgery for mechanical complications? Is there any preclinical data to suggest this? Do antiretroviral medications or other treatment increase the risk of non-fusion?

Reply 2: These are all good points. We performed a further literature review and added some more information to why HIV patients are more at risk for 2-year revisions (low bone mineral density and ART).

Changes in the text 2: Introduction-Page 4, line 81, lines 86-98; Results-Page 10, lines 196-197 (data on osteoporosis); Discussion-Page 13, lines 241-246, 256-258, 309-313

Comment 3: Or is it just due to SSI as suggested by one of the citations (Fanous et al.)? If this is the argument, then authors need to provide a stronger introduction and discussion around this issue. How and why an infection would cause failure 2 years after surgery for lumbar spondylosis. What is the pathological mechanism that would impair fusion, cause ASD, cause PJK?

Reply 3: Also an excellent point. We added more information on why infection causes failure 2 years after surgery. We also added a pathological mechanism that explains why this occurs.

Changes in the text 3: Introduction-Page 5, lines 100-106; Discussion-Page 113, lines 241-246.

Comment 4: I am unsure how much this study adds to the literature. Unless the authors can make a stronger argument as to why it is important to study 2-year revision surgery rates (other than for infection or medical complications which we already know may be higher in HIV patients), it seems this study does not add anything and is rather another national database study looking at simple associations.

Reply 4: Thank you for the constructive feedback.

Reviewer B

Comment 1: This is an excellent manuscript that addresses the problematic issue surrounding risk of surgical complications in patients infected with HIV.

The authors have done a thorough assessment, and I applaud their use of a large database since single-center databases are insufficient to capture a large enough sample size.

Reply 1: Thank you for taking the time to review this manuscript.

Minor revisions:

Comment 2: Intro:

Page 4, line 97 -- omit "initially"

Reply 2: Thank you for your comment.

Changes in the text 2: We have removed the word "initially" from this line. (Page 5, line 111)

Comment 3: Page 4, line 99 -- changed to "predicted"

Reply 3: Thank you for your comment.

Changes in the text 3: We have changed the word "predict" to "predicted" in this line. (Page 5, line 112)

Comment 4: Page 7, line 196 -- to better understand the pulm cx result --somewhere in the methods -- can you describe what constitutes PULM disorders at baseline.

Reply 4: Thank you for your comment. We have added in a reference to the paper which lists the ICD-9 codes for all of the Elixhauser comorbidities we analyzed. The "pulmonary circulatory disorders" group is characterized by ICD-9-D-4160 to ICD-9-D-4169 and ICD-9-D-179. These codes represent pulmonary hypertension, kyphoscoliotic heart disease, chronic pulmonary embolism, other chronic pulmonary heart conditions, and chronic pulmonary heart conduction unspecified. The "chronic obstructive pulmonary disease (COPD)" group is characterized by ICD-9-D-490 to ICD-9-D-4928, ICD-9-D-493 to ICD-9-D-49391, ICD-9-D-494, ICD-9-D-495 to ICD-9-D-505, ICD-9-D-5064.

Changes in the text 4: We have also corrected our references to these comorbidities in our text and our tables (Results- Page 10, lines 208-209, Tables- Page 24-27)

Comment 5: Also any hypothesis on why AIDS pts had less pulm disorders compared to asymptomatic HIV.

Reply 5: Wow great catch! That was a mistake, we accidentally added the AIDs result for PulmCirc instead of Pulm. Turns out all classes of HIV are more likely to have chronic pulmonary diseases. I deleted that sentence.

Changes in the text 5: Deleted- Results: Page 11, line 217

Comment 6: Page 7, line 203 -- do not capitalize "Overall"

Reply 6: Thank you for your comment.

Changes in the text 6: We remove the word "Overall" (Results: Page 11, line 223)

Comment 7: Were you able to capture any CD4+ cell count data -- sometimes that is helpful in understanding the level of immune restoration for asymptomatic HIV patients.

Reply 7: Thank you for your comment. Unfortunately, due to the limitations of the database, we are unable to extract patient lab values. Therefore, we were unable to include CD4+ cell count data in our analysis.

Changes in the text 7: We added this to the limitations paragraph (Discussion: Page 15, lines 330-332)

Comment 8: For AIDS patients, please define that it meets the CDC criteria for AIDS classes.

Reply 8: Thank you for your comment. We have added in the definition used by the CDC to classify AIDS patients and how our data extraction followed this criteria. Based on the CDC guidelines, B20 represents patients who have an HIV positive states. The code 042 has been determined by the CDC to identify patients who have acquired immunodeficiency syndrome. The codes Z21 and V08 are defined as patients with a positive HIV status who are asymptomatic. Two references for the CDC guidelines on AIDS/HIV classification have been added to the methods section.

Changes in the text 8: Methods-Page 7, lines 147-149

Comment 9: Tables -- this is a style issue -- but i think it would be clearer to list the categories of HIV" as "ALL HIV Patients" -- bc then you have the Asymptomatic HIV and AIDS.

Reply 9: Thank you for your suggestion. We have changed the formatting of the tables to include " ALL HIV Patients" as the header for the "HIV" group.

Changes in the text 9: Tables-Page 24-27