Tracheostomy after cardiac surgery: What have we learned?

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Disclosures: Authors have nothing to disclose with regard to commercial support.

Received for publication Jan 8, 2017; accepted for publication Jan 12, 2017; available ahead of print Feb 22, 2017.

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J Thorac Cardiovasc Surg 2017;153:1401

0022-5223/\$36.00

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<http://dx.doi.org/10.1016/j.jtcvs.2017.01.021>

Performing tracheostomy after cardiac surgery can in theory increase the risk of sternal wound infection, with secretions descending from the cervical stoma into the previously opened mediastinal space or with stomal secretions coming into direct contact with the sternotomy incision. Delaying tracheostomy until healing of the sternal wound and scarring of the mediastinum to exclude this space from the neck or performing tracheostomy by percutaneous technique to minimize dissection and the chance of creating communication between the mediastinum and neck would thus in theory decrease the risk of sternal wound infection. These theories, however, have never been supported by high-quality data. The study published in this month's *Journal* by Toeg and colleagues¹ attempts to answer these important questions.

Through systematic review and meta-analysis, Toeg and colleagues¹ found a 7% incidence of sternal wound infection after tracheostomy in cardiac surgical patients. The rate of sternal wound infection was not different according to whether tracheostomy was performed early (<14 days) versus late (≥ 14 days), by open versus percutaneous technique, or in the recent era (2007 to 2014) versus an earlier era (2000 to 2007). Metaregression analysis found no significant relationship between the incidence of sternal wound infection and the days until tracheostomy after cardiac surgery. Toeg and colleagues¹ found striking mortalities of 23% at 30 days and 63% at 1 year in this patient population.

Before accepting the conclusion of any meta-analysis, it is important for readers to examine the quality of the studies included. This meta-analysis by Toeg and colleagues¹ included 13 studies with a respectable number of patients (10,088). Of the 13 studies, however, 11 were retrospective in nature and only 4 were rated "good" by Toeg and colleagues.¹ In addition, the studies lacked detail regarding patient comorbidity and surgical procedures performed, and there was significant study heterogeneity. With the limitations of this meta-analysis, it may be difficult to make any

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Central Message

Mortality is high among patients requiring tracheostomy after cardiac surgery. Prospective studies are needed to examine this striking result further.

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firm conclusions regarding the timing and technique of tracheostomy and its effect on sternal wound infection.

This study by Toeg and colleagues¹ does illustrate several important points. Their finding of no lower rate of sternal wound infection with delayed tracheostomy or with percutaneous technique is somewhat surprising, because these results do not support the previously discussed theories regarding tracheostomy after cardiac surgery. The results would suggest that in these critically ill patients, tracheostomy is associated with but does not cause sternal wound infection, so that there is no advantage in the delayed timing or the percutaneous technique of tracheostomy. This meta-analysis by Toeg and colleagues¹ also shows us how imperfect the existing data are, despite the large amount of published literature on the subject, and that high-quality prospective studies are needed while questions regarding tracheostomy in cardiac surgical patients remain truly unanswered. Finally, further studies are also warranted to examine the staggering mortality in this cohort of cardiac surgical patients requiring tracheostomy, which perhaps is the most eye-opening result reported by Toeg and colleagues.¹

Reference

1. Toeg H, French D, Gilbert S, Rubens F. Incidence of sternal wound infection after tracheostomy in cardiac surgery patients: a systematic review and meta-analysis. *J Thorac Cardiovasc Surg*. 2017;153:1394-400.