The Importance of Oral Health for Cardiothoracic and Vascular Patients

Jeffrey Yasny

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Jeffrey Yasny, DDS[1]

Abstract

Prior to cardiothoracic or vascular surgery, a patient's oral health is not usually a high priority for the surgical team. Yet, oral neglect often mirrors systemic disease and the need for proper dental care is often unmet. In the perioperative period, the presence of untreated decayed teeth and periodontal disease can result in a potent odontogenic infection with significant consequences. Patients can unknowingly present for such operations with undetected oral infections that can magnify the likelihood of an adverse outcome, increase costs, morbidity, and possibly mortality. Considering scheduling constraints and the urgency of the procedure, a pre-operative dental screening is suggested for patients who undergo elective cardiothoracic or vascular surgery, to ensure that any oral infection is diagnosed and definitively treated. Implementing such an effective and preventive approach can improve surgical outcome and overall patient health.

Keywords

oral health, perioperative, surgery, periodontal, dentistry

Many patients requiring cardiothoracic or vascular procedures possess poor oral health. The presence of decayed teeth, untreated dental abscesses, and periodontitis represent potent causes of an odontogenic infection. In the perioperative period, this has the potential for magnified expenses and deleterious effects on surgical outcome. This article will elaborate on the association between oral health and cardiovascular disease (CVD) and present rationale for optimizing dentition prior to elective cardiothoracic or vascular surgeries. On increasing one's familiarity with perioperative dental considerations for such patients, pertinent measures can be taken that minimize related costs and optimize patient care.

The first theories of a connection between oral health and systemic health can be traced back to the 19th century.[1] Current information regarding the pathogenesis and treatment of CVD suggests that oral health can be an important factor in the exacerbation of preexisting coronary disease.[2,3] Oral microbes congregate as dental plaque, coating the surfaces of teeth. Dental plaque provides a microhabitat for organisms that can translocate and colonize in other parts of the body, damaging vital organs.

Poor oral health, especially if it involves a compromised periodontal status, is an important associated risk factor for infective endocarditis (IE) and associated sequelae. Although IE is a rare condition in the general population, it continues to be a serious complication mainly in patients who possess susceptible cardiac conditions. Endocarditis usually develops in individuals with underlying structural cardiac defects who develop a bacteremia.[4] Blood-borne bacteria may lodge on damaged or abnormal heart valves, the endocardium, or the endothelium near anatomic defects, resulting in this specific type of inflammation. Traditionally in the surgical environment, preventive pharmacological measures have been used. The American Heart Association released updated guidelines for the prevention of IE, with changes regarding who should receive antibiotic prophylaxis.[5]

Dental diseases are the most common infectious diseases in the world.[6] Chronic infections such as periodontal disease may play a role in the initiation and development of CVD. Periodontal disease commonly manifests in an adult's mouth as inflamed gingiva, gingival recession, and calculus (ie, tartar) accumulation.[7] Periodontitis is a local inflammatory process involving a bacterial infection of the supporting structures of the teeth. This disease process is also characterized by systemic inflammatory host responses that may contribute to the reported elevated risk of CVD among patients with periodontal disease.[8] Several periodontal organisms including *Porphyromonas gingivalis*, *Treponema denticola*, *Streptococcus sanguinis*, and *Actinobacillus actinomycetemcomitans* have been detected directly within the atherosclerotic plaque lesion of the vessel wall.[9] Moreover, optimizing a patient's

[1]Mount Sinai School of Medicine, New York, NY, USA

Corresponding Author:
Jeffrey Yasny, Department of Anesthesiology, Mount Sinai School of Medicine, One Gustave L. Levy Place, Box 1010, New York, NY 10029, USA
Email: jeffrey.yasny@mountsinai.org

dentition and periodontal health has been shown to lower the risk of CVD.[10]

Improving one's oral health is usually dependent on the individual receiving regular professional dental care.[11] However, unmet dental care needs exist among patients with chronic diseases,[12] and obtaining routine intraoral care may be limited by several barriers.[13] For example, people who are tired or dependent on help seem to be at a higher risk of not using dental services regularly.[14] Financial constraints, inaccessibility to dental professionals, a lack of patient education, and dental phobia all contribute to irregularly scheduled or even no visits to the dentist. It was also found that 31% of elderly patients had not seen a dentist in the previous 5 years.[15] These patients may experience a greater incidence of poor oral hygiene, tooth decay, and periodontal disease. Thus, patients presenting for cardiothoracic or vascular surgery who have not had a dental examination for years may be harboring an undetected oral infection that can significantly compromise surgical outcome—even before it commences.

Postoperative infections may result in an increased morbidity rate, delayed wound healing, extended hospital stays, and higher costs.[16,17] At some medical centers,[18] prior to a cardiac transplant or another transplantation procedure, it is mandatory for a patient to undergo a complete physical examination by a series of specialists in order to rule out any potential source of infection. Included in this systemic checklist is the requirement of a thorough evaluation by a dentist. A clinical examination, intraoral radiographs, and any other indicated treatment is essential prior to the patient being "cleared" for surgery from an oral health standpoint. The implementation of this protocol should be strongly considered by cardiothoracic and vascular surgical teams.

In the preoperative period, it may not be a dentist who initiates or discovers the necessity of dental treatment for a surgical patient. It may be a nurse, anesthesiologist, or another health care provider who is the first caregiver to look inside a patient's mouth in years, or even decades. In some instances, a "hands-on" evaluation of the patient's dental status (ie, wearing a glove and inspecting more closely) is recommended to better appreciate any vulnerable teeth or soft tissues. Notable redness, swellings, purulent discharge, or fistulas may be visible along the gingiva and symptomatic of an odontogenic infection.[19]

When poor dentition has been identified prior to surgery, the benefit of treating a chronic condition, such as moderate periodontitis, must be evaluated with a proper perspective. Comprehensive treatment usually requires multiple dental sessions, whose duration may span several months. Often, this is not practical given the immediacy of a major cardiothoracic or vascular procedure. However, an acute symptomatic infection presenting as an abscess should be aggressively treated prior to the operation, usually by means of a tooth extraction, periodontal treatment, or endodontic (ie, root canal) therapy. The time for allowing sufficient intraoral healing from such dental treatment may be compromised because of scheduling constraints and/or urgency of the surgery. Therefore, an appropriate risk versus benefit analysis is warranted.[20]

Because an association exists between poor oral hygiene and various systemic diseases, many patients scheduled for cardiothoracic and vascular surgeries inherently possess poor oral hygiene and untreated odontogenic infections, which may be costly and compromise surgical success. Where time permits, a thorough preoperative dental examination and indicated treatment can save invaluable time and money. Most significantly, implementing such effective and preventive action can improve surgical outcome and overall patient health.

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References

1. Miller WD. The human mouth as a focus of infection. *Dent Cosmos*. 1891;33:689-713.
2. Jansson L, Lavstedt S, Frithiof L, Theobald H. Relationship between oral health and mortality in cardiovascular diseases. *J Clin Periodontol*. 2001;28:762-768.
3. Buhlin K, Gustafsson A, Hakansson J, Klinge B. Oral health and cardiovascular disease in Sweden. *J Clin Periodontol*. 2002;29:254-259.
4. Gordon SC, Barasch A, Foong WC, Elgeneidy AK, Safford MM. Does dental disease hurt your heart? *J Can Dent Assoc*. 2005;71:93-95.
5. Wilson W, Taubert KA, Gewitz M, et al. Prevention of infective endocarditis: guidelines from the American Heart Association. *J Am Dent Assoc*. 2007;138:739-760.
6. Dajani AS, Taubert KA, Wilson W, et al. Prevention of bacterial endocarditis. Recommendations by the American Heart Association. *JAMA*. 1997;277:1794-1801.
7. Boehm TK, Scannapieco FA. The epidemiology, consequences and management of periodontal disease in older adults. *J Am Dent Assoc*. 2007;138(Suppl):26S-33S.
8. Geerts SO, Legrand V, Charpentier J, Albert A, Rompen EH. Further evidence of the association between periodontal conditions and coronary artery disease. *J Periodontol*. 2004;75:1274-1280.
9. Beck J, Eke P, Heiss G, et al. Periodontal disease and coronary heart disease: a reappraisal of the exposure. *Circulation*. 2005;112:19-24.
10. Amar S, Han X. The impact of periodontal infection on systemic diseases. *Med Sci Monit*. 2003;9:RA291-RA299.

11. Johnson NW, Glick M, Mbuguye TN. Oral health and general health. *Adv Dent Res*. 2006;19:118-121.
12. Griffin SO, Barker LK, Griffin PM, Cleveland JL, Kohn W. Oral health needs among adults in the United States with chronic diseases. *J Am Dent Assoc*. 2009;140: 1266-1274.
13. Riley JL, Gilbert GH, Heft MW. Dental attitudes: proximal basis for oral health disparities in adults. *Community Dent Oral Epidemiol*. 2006;34:289-298.
14. Avlund K, Holm-Pedersen P, Schroll M. Functional ability and oral health among older people: a longitudinal study from age 75 to 80. *J Am Geriatr Soc*. 2001;49:954-962.
15. Gilbert GH, Duncan RP, Crandall L, Heft MW. Older Floridians' attitudes toward and use of dental care. *J Aging Health*. 1994;6:89-110.
16. Ferschl MB, Tung A, Sweitzer B, Huo D, Glick DB. Preoperative clinic visits reduce operating room cancellations and delays. *Anesthesiology*. 2005;103:855-859.
17. Dexter F, Abouleish AE, Epstein RH, Whitten CW, Lubarsky DS. Use of operating room information system data to predict the impact of reducing turnover times on staffing costs. *Anesth Analg*. 2003;97:1119-1126.
18. Turcotte J, Magee J, Bromberg J, et al. Update of the adult and pediatric liver transplant program at the University of Michigan. *Clin Transpl*. 1996:203-216.
19. Yasny JS, Silvay G. The value of optimizing dentition before cardiac surgery. *J Cardiothorac Vasc Anesth*. 2007; 21:587-591.
20. Yasny JS, White J. Dental considerations for cardiac surgery. *J Card Surg*. 2009;24:64-68.