

Pretreatment of prosthetic valve sewing-ring with the antibiotic/fibrin sealant compound as a prophylactic tool against prosthetic valve endocarditis.

Authors: Karck M., Siclari F., Wahlig H., Sperling U., Schmid C., Haverich A.

Publication Date: 1990

Abstract:

Prosthetic valve endocarditis (PVE) remains a dreaded complication following heart valve replacement despite perioperative antibiotic (AB) prophylaxis. In order to increase the AB concentration in the sewing ring, an experimental study including topical application of the gentamicin derivative EMD 46/217 and fibrin sealant (F) as AB-carrier was initiated. In vitro pretreatment of Dacron with the gentamicin derivative and F was followed by constant AB release for 3 weeks. In a subsequent animal study, four Dacron rings with different pretreatment were implanted in the descending aorta of 10 pigs after direct contamination with 10(8) *Staphylococcus aureus* solution. One ring was pretreated with the AB/F compound, a second ring with the AB alone. Ring 3 (no pretreatment) and ring 4 (F alone) served as controls. After 1 week, the sewing rings and their corresponding implantation sites were assayed for measurement of AB-content and for culture. The AB content of AB/F-rings was 24.99 +/- 7.16 micrograms/g wet weight, while rings pretreated with the AB alone contained no measurable drug amounts with the exception of one specimen (0.5 microgram/g) (AB/F vs. AB-rings: P less than 0.0005). The corresponding implantation sites to AB/F rings contained 1.07 +/- 0.54 micrograms/g AB, whereas in only 2 of 10 implantation sites of AB rings, low AB levels were found (0.05 and 0.2 micrograms/g) (AB/F vs. AB ring implantation sites: P less than 0.0005). While all control rings and 9 of 10 AB rings were infected, 5 of 10 AB/F rings remained sterile after culture (AB/F vs. AB rings: P = 0.05). This finding correlated with the AB content in the suture rings.(ABSTRACT TRUNCATED AT 250 WORDS)