Sonication – a new tool for optimizing the diagnosis of implant associated infections.

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Background - The use of different medical devices has greatly improved quality of life for an increasing number of patients. However, the presence of an implant leads to a higher risk of infection. Sonication is a new diagnosis method using low frequency ultrasound that produces dislocation of bacteria from implant surface, without cell destruction enabling culture of viable microorganisms. In Romania, sonication was first introduced in 2012. Our aim is to present the experience of National Institute of Infectious Diseases “Prof. Dr. Matei Bals” with this new technique in diagnosing the implant associated infection.

Methods – We performed sonication by using BactoSonic® ultrasonic bath (Bandelin, Germany). The sonication fluid, containing microorganisms dislodged from the device surface, were cultured thereafter on aerob and anaerob broth up to 14 days. To identified the bacterial strains and their susceptibility to different antibiotics we used Vitek® automated system (BioMérieux, France).

Results – In 2 and a half years, a total of 85 implants were sonicated, among those implants 75% were orthopedic implants and 12% breast implants. After sonication we obtained 87% positive results, around 1/3 of the infections being polymicrobial. For orthopedic implants the most frequent etiology was coagulase-negative staphylococci (32,1%), followed by staphilococcus aureus (28,5%). Also, we observed a high percent (28,6%) of infection with gram-negative rods, with important antibiotic susceptibility problem. Of 10 brest implants, one was positive with Staphilococcus epidermidis and Propionibacterium acnes. A correlation between clinical and microbiological findings was found in the majority of cases.

Conclusions - Sonication improves the microbiological diagnosis of implant associated infections, revealing even polymicrobial and nosocomial infections. A multidisciplinary approach is very important for the management of implant associated infections.