

Abstract

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The operation was successful, but the patient was infected. Antibiotic resistances from the patient's point of view.

In 2015, according to the German Endoprosthesis Register (EPRD), there were around 400 000 hip and knee joint endoprostheses. Thus, total joint replacement ranks among the 20 most common surgeries in Germany. The procedures are subdivided into primary implantation and implant exchange. After such an endoprosthetic procedure, severe complications may occur.

According to EPRD, infections are the second leading cause after the loosening of the implant to exchange the prosthesis – with upwards tendency. In 2013, 11.1 per cent of the prostheses were exchanged due to infection, in 2015, the share was 15.6 per cent already. It remains unclear whether this increased number reveals an actual increase in infections or whether it is due to improved diagnostics. However, one thing is certain: many infections remain unrecognised and official numbers are clearly underestimated.

The spectrum of potential pathogens is diverse in endoprosthetics. With 70 per cent, staphylococci have the highest share of infections; most pathogens are resistant to standard antibiotics. The pathogens can reach the joints during the surgery or because of pneumonia, respiratory tract or urinary tract infections. Once in the joint, the bacteria form dangerous biofilms on the prostheses.

The consequences are serious, as implant infections have considerable detrimental effects on the quality of life, including chronic pain, immobility and additional operations that again can involve further health restrictions.

To complicate matters further, the symptoms of a joint infection are often not recognised or only very late. This also shows the example of a young police officer: her symptoms such as fever and sweating were initially attributed to a hormonal disease. Before the cause of the painful disease was identified, namely a nosocomial MRSA infection linked to the knee implant, the patient even contemplated an amputation of her leg. This case's turning point was a new treatment concept at Charité in Berlin, Germany.

The concept consists of differentiated diagnosis and innovative interdisciplinary therapy. Key element of the therapy: an improved microbiological diagnosis to exactly identify the type of pathogen on the removed prosthesis. For this, the prosthesis is sonicated to remove the bacterial biofilm, which is then analysed. The improved diagnostic methods include new molecular methods that can detect the genetic material of bacteria despite previous antibiotic therapy. This allows to



adapt the antibiotic to the pathogen and use it in a targeted manner. A rational antibiotic therapy ensures a healing success, prevents re-infection and contributes to not cause further resistances. In the case of the police officer, the differentiated therapy regimen could prevent an amputation and re-establish complete pain-free mobility.

Sources

“The operation was successful, but the patient was infected. Antibiotic resistances from the patient’s point of view.”
Speech by Dr. Andrej Trampuz, Senior Physician, Head of Infectiology and Septic Surgery, Charité Berlin, Germany held at the Lunchtime Symposium “Pathogens resistant to antibiotics: new hygiene strategies along the patient journey”, 17 November 2016, Berlin, arranged by the BODE SCIENCE CENTER, Hamburg, scientific centre of excellence of PAUL HARTMANN AG, Heidenheim.

