O12

BACTERIAL BIOFILMS ON EXCISED POLYPROPYLENE MIDURETHRAL MESH SLINGS

N. Abbas, C. El-Chami, M. Basu, F. Reid, A. J. McBain

Introduction:

Long-term midurethral sling (MUS) complications have been related to chronic inflammation and explanted MUS have shown evidence of bacterial colonisation (1). Whilst biofilms have been implicated in implant complications in other areas of medicine (2), there is no comprehensive study of biofilms on MUS. This study aimed to assess if biofilms were present on all MUS and assess differences between complications, with a view to inform clinical management.

Methods:

Biofilm imaging methodology was validated as previously reported, using MUS which had never been implanted and sterile (negative control), or inoculated with lab strain Pseudonmonas aeroginousa to form biofilms (positive control). The presence of biofilms on mesh excised for the complication of chronic pain, vaginal mesh exposure, lower urinary tract (LUT) perforation and recurrent incontinence were compared. Mesh samples (n= 112) from 52 women were imaged using confocal laser scanning microscopy after the application of eubacterial FISH probe (red, bacterial 16S rRNA gene, EUB338), TOTO-1 (green, extracellular DNA in biofilm matrix), and DAPI (blue, counterstain host cells).

Results:

Biofilms were observed in all samples (Figure 1), with bacteria observed in clusters. The vaginal portions of MUS were found to have higher biofilm volumes than retropubic or obturator portions, $p<0.0005$. Vaginal mesh exposure was not associated with a higher volume of bacterial biofilms on vaginal mesh, $p=0.2$.

Conclusion:

Whilst all mesh samples had biofilms, sections from the vagina had higher volumes of biofilms than those from retropubic or obturator sites. Exposed mesh did not have significantly thicker biofilms, suggesting that there is a tipping point between colonisation as biofilms and mesh infection. The volume of biofilms was not found to be associated with the clinical complications. Further research should characterise the bacteria present (mesh microbiome) and investigate the inflammatory response to different bacteria. This may provide potential therapeutic targets.

References

1. Mellano EM, Nakamura LY, Choi JM, Kang DC, Grisales T, Raz S, et al. The Role of Chronic Mesh Infection in Delayed-Onset Vaginal Mesh Complications or Recurrent Urinary Tract Infections. Female Pelvic Med Reconstr Surg. 2016;22(3):166–71.

2. Srivastava A, Chandra N, Kumar S. The role of biofilms in medical devices and implants. Biofilms Hum Dis Treat Control. 2019 Jan 1;151–65.