

عنوان مقاله:

Review Article: Application of Electrical Impedance Spectroscopy in Bladder Cancer Screening

محل انتشار:

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خلاصه مقاله:

Introduction Bladder cancer is the most common malignancy in elderly people and most bladder cancers are transitional cell carcinomas (TCC). Bladder pathology is usually investigated visually by cystoscopy and this technique can represent different conditions ranging from simple inflammation to flat CIS. However, biopsies must be taken from the suspected area to obtain diagnostic information. This is a relatively high cost procedure in terms of both time and money and is associated with discomfort for the patient and increased morbidity. **Materials and Methods** Electrical impedance spectroscopy (EIS), a minimally invasive screening technique, can be used to separate malignant areas from non-malignant areas in the urinary bladder. The feasibility of adapting this technique to screen bladder cancer, and abnormalities during cystoscopy has been explored and compared with histopathological evaluation of urinary bladder lesions. Both ex vivo and in vivo studies were carried out in this study. **Results** The impedance data were evaluated in both malignant and benign groups and a significant difference between these two groups was revealed. In all measurements, the impedivity of malignant bladder tissue was significantly higher than the benign tissue, especially at lower frequencies ($p < 0.001$) **Conclusion** This technique can be a complimentary method for cystoscopy, biopsy, and histopathological evaluation of the bladder abnormalities.

کلمات کلیدی:

Bladder cancer, Electrical Impedance Spectroscopy, Finite Element Modelling, Minimally Invasive Technique, ROC Curves

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