AB065. Confocal laser endomicroscopy for diagnosing malignant bladder tumour: a pilot study

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Background: To perform an exploratory investigation on confocal laser endomicroscopy (CLE) in the diagnosis of malignant bladder tumour.

Methods: From June 10 to July 11, 2017, patients initially diagnosed with bladder cancer by cystoscopy were hospitalised and had undergone white light cystoscopy (WLC) + CLE examination followed by transurethral resection of bladder tumour (TURBT) on suspected lesions. WLC and CLE imaging results were recorded and validated by pathologic specimens.

Results: Lesions confirmed by histopathology were 3 low-grade non-invasive papillary urothelial carcinomas, 1 high-grade non-invasive papillary urothelial carcinoma, 1 low-grade invasive urothelial carcinoma, 1 high-grade invasive urothelial carcinoma, 1 carcinoma *in situ* (CIS), 1 high-grade dysplasia, 1 cystitis glandularis, 1 chronic inflammation, and 1 scar tissue. For CLE images in the normal urothelium, three layers of cells with different presentation were observed, namely, the superficial umbrella cells, the intermediate cells smaller in size and uniformly shaped, and the capillary network in the lamina propria. For non-invasive urothelial carcinoma, tumour cells appeared as papillary lesions growing from fibrovascular cores, with low-grade cells appearing monomorphic and more cohesively arranged, and high-grade cells relatively pleomorphic, more disorganised and with tortuous blood vessels in the fibrovascular core. For invasive urothelial carcinoma, tumour cells invaded the lamina propria, with uniform appearances, poor cohesion and indistinct cellular borders, and high-grade ones were more pleomorphic. CIS and inflammation both appeared as erythematous patch-like flat lesions under WLC and sometimes difficult to differentiate. Under CLE, the former appeared as dysplastic and disorganised cells with indistinct cellular borders, with intact lamina propria, and inflammatory cells were discovered as infiltrative clusters in the lamina propria that were uniformly shaped and loosely connected. Dysplasia appeared somewhat similar compared with CIS under WLC, but with lower cellular irregularity as confirmed with pathology. Cellular appearance and structure in scar tissue were similar to that in the normal urothelium, but superficial umbrella cells were more likely absent, with thinner cell layers, and inflammatory infiltration was sometimes discovered in the lamina propria.

Conclusions: CLE provides real-time cellular imaging of the urothelium, and shows promising potential for clinical diagnosis, especially in differentiating flat urothelial lesions. Large prospective studies are required for further validation.

Keywords: Bladder cancer; cystoscopy; confocal laser endomicroscopy (CLE); pathological diagnosis

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