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Management of Diaphragmatic Defects Using ICG Fluorescence Imaging System in Peritoneal Dialysis Patients with Pleuro-peritoneal Communications: Two Case Reports

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Case Study: Pleuro-peritoneal communication (PPC) is a serious complication but conventional treatment (ex. indigocarmine method) has been unsatisfactory with high recurrence rate. Herein, we report two cases of PPC, successfully diagnosed by indocyanine green (ICG) staining under infrared camera during with video-assisted thoracoscopic surgery (VATS).

Case1

A 38-year-old woman with end-stage kidney disease developed right pleural effusion a month after starting PD. Analysis of the pleural fluid study showed transudative with increased pleural fluid-serum glucose ratio of 7. CT peritoneography scan showed a leakage of contrast medium over the right diaphragm. After draining pleural effusion, viscum album was infused to induce pleurodesis. However, pleural effusion recurred soon after resuming PD, 3 weeks after repeated pleurodesis for 3 cycles. Then, we used 20 mg of ICG mixed with 2 liters of 1.5% glucose dialysate to help detect diaphragmatic defect. After a few minutes of dialysate infusion, a green fluorescent material leakage confirming diaphragm defects were seen under infrared camera. The defects were resected and plicated. Talc was introduced to consolidate pleurodesis. PD was resumed after 2 weeks postoperative day and the patient has been on PD without recurrence for 5 months.

Case2

A 52-year-old woman presented with progressive right pleural effusion after a month of starting PD. CT peritoneography was compatible with PPC. Dialysate mixed with ICG was infused during VATS, and confirmed localization of diaphragmatic defect which was resected and sutured in a similar fashion. PD was resumed after 2 weeks post-surgery and the patient has been on PD without recurrence for 2 months.

ICG fluorescence imaging system facilitates detecting even the slightest leakage by providing an accentuated contrast image of green light with dark surroundings. By making accurate diagnosis and precisely identifying the localization of PPC, we believe the success rate of the surgery will be much higher.

Fig1