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## Subcutaneous hydration: a potentially hazardous route

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### EDITOR:

Subcutaneous hydration, also called hypodermoclysis, is commonly used in elderly patients. We report a case of colonic perforation in order to raise awareness that this technique is not fully harmless.

### Case report

An 86-yr-old lean (45 kg, 165 cm) female was admitted to our emergency department with abdominal pain and vomiting. Her past medical history included untreated hypertension and advanced dementia. She was living in an institution. Symptoms had begun 1 week previously with difficulties in feeding and drinking. Parenteral hydration was started with a subcutaneous infusion of normal saline via a 24-G short needle in the right inferior quadrant of the abdomen. No immediate complication was reported during the puncture. Confusion developed a few hours later and bilious vomiting appeared the day after. She was then transferred to our institution for investigation.

Pain and diffuse tenderness were the only abnormalities reported at physical examination. Abdominal wall inspection noted a needle puncture hole without fluid loss or inflammation in the right iliac fossa. Neither her general nor haemodynamic status were altered. Temperature was 36.3°C. Acute renal failure was the only observed biological abnormality. Abdominal computed tomography (CT) scan showed subcutaneous emphysema,

global intestinal distension and pneumoperitoneum (Fig. 1). Punctiform caecal perforation close to the skin needle site was discovered during a laparotomy and led to caecal resection with ileostomy and colostomy. General peritonitis required amoxicillin/clavulanic acid administration. The patient fully recovered and was returned to her institution 2 weeks later.

### Discussion

Hydration and electrolyte balance in the elderly is a real challenge. Management in institutions adds the



**Figure 1.** Abdominal computed tomography (CT) scan with contrast injection shows subcutaneous emphysema (arrow) and pneumoperitoneum.

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issues of a poor medical and nursing environment and sometimes non-cooperative patients. A nasogastric tube is often not well tolerated. Whereas intravenous (i.v.) catheterization is considered as invasive, the subcutaneous space is considered as a useful route for fluid diffusion or infusion. Compromised peripheral venous vascularization can be another indication for hypodermoclysis as an alternative to central venous access. Evidence-based studies are lacking [1]. Three main sites can be considered: arms or legs are the safest choices, but are limited by induced discomfort or unintentional removal during movement. Abdomen puncture is an alternative. The left iliac fossa should be chosen because at that point there is a maximal distance between the colon and the abdominal wall. Careful aspiration is the rule before injection so as to detect vessel injury or air aspiration. Only one case of major infection has been reported [2]. Obesity or insulin injection does not increase the risk of iatrogenic complications [3]. In the same way no colonic perforation during ascites paracentesis has been described. Colonic damage occurs mostly from inside to outside during endoscopic procedures or after foreign body ingestion. Prognosis depends on treatment delay [4] because of peritonitis. Perforation could be favoured by a thin and slim abdominal wall musculature related to old age. The CT scan findings are easily explained by the mechanism of colonic injury. Intestinal distension is explained by the reflex ileus encountered during peritonitis. More interesting is the presence of subcutaneous emphysema related to the diffusion of the pneumoperitoneum through the needle track.

To conclude, physicians should be alert to the possibility of potential life-threatening complications

linked with the subcutaneous route. Nevertheless, owing to the favourable benefit/risk balance hypodermoclysis seems a good alternative to i.v. or oral rehydration in the elderly as long as basic safety rules are respected.

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## Anaesthetic considerations in parathyrotoxic crisis

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### EDITOR:

Primary hyperparathyroidism (pHPT) is the most common cause of hypercalcaemia, accounting for more than 50% of cases [1]. Symptoms associated with hypercalcaemia generally correlate with both

the magnitude and the rapidity of the increase in serum calcium. However, patients vary in their sensitivity to serum calcium elevations.

Hypercalcaemia increases the risk of anaesthesia because of potentially dangerous disturbances in cardiac rhythm. Moreover, HPT has been reported to coexist in 20–60% of the cases with nodular thyroid disease. Perioperative management of these patients should, therefore, include careful evaluation of the airway as the extent of compression and deviation caused by the mass can lead to a

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