maintained at 95% level, but the patient still snored seriously. Physical examination showed that the patient could freely uplift his head for more than 5 s, and had a strong hand-shake with the normal train-of-four ratio. Although snoring persisted, the patient could not tolerate oropharyngeal airway. Marked subcutaneous crepitus was now obvious, especially in the area of the cheek, neck, chest, abdomen, and limbs. Subcutaneous emphysema was apparent. After monitoring NAP, heart rate, SpO2, and arterial blood gas analysis in the operating theatre, and using mask pressure breathing assist with high-flow oxygen on and off for 2 h, the subcutaneous crepitus started to reduce significantly, and also the snoring started to resolve with the return of adequate breathing.

The upper respiratory tract obstruction is a risk factor that may result in serious consequences. During the post-anaesthesia recovery period, many factors may lead to upper respiratory tract obstruction. In this patient, retroperitoneal insufflation with CO2 induced buccopharyngeal submucosal emphysema, which was found after operation, led to respiratory tract obstruction.

The reasons for buccopharyngeal submucosal emphysema and upper respiratory tract obstruction in this case could be the long time of retroperitoneum laparoscopic surgery, and high airway pressure. The E\textsubscript{CO2} increased implying CO2 absorption. The patient had no previous history of obstructive airway disease, and because the muscle power had returned to normal, the snoring could only be attributed to upper airway emphysema.

According to reports in the literature, subcutaneous emphysema can lead to pneumopericardium and pneumomediastinum. In this case, maxillofacial subcutaneous emphysema was severe, and submucosal emphysema as a complication occurred at the same time.

**Declaration of interest**

None declared.

J. L. Zhang*
J. Wang
R. Q. Li
J. C. Tang
Wuxi, China

*E-mail: zjldqzyw@126.com

2 Santana A, Crausman RS, Dubin HG. Late onset of subcutaneous emphysema and hypercapnia following laparoscopic cholecystectomy. *Chest* 1999; 115: 1468–71
3 Ko ML. Pneumopericardium and severe subcutaneous emphysema after laparoscopic surgery. *J Minim Invasive Gynecol* 2010; 17: 531–3
5 Loughlin MT, Duncan TJ. Iatrogenic pneumomediastinum and subcutaneous emphysema as a complication of colonoscopy with cold forceps biopsy. *Mil Med* 2012; 177: 474–6
doi:10.1093/bja/aes488

**Effects of sevoflurane and propofol anaesthesia on cerebral oxygenation during normocapnia and mild hypercapnia: a pilot study**

Editor—In clinical practice, patients undergoing laparoscopic surgery are at risk of mild-to-moderate hypercapnia and CO2-mediated cerebral haemodynamic effects. Regional cerebral oxygen saturation (rSO2) has also been used to monitor disturbances of cerebral perfusion, which may reflect tissue oxygen use. Sevoflurane and propofol have been widely used as anaesthetic agents for this surgery. Recent evidence has suggested that the effect of these anaesthetics on cerebral oxygenation may differ. However, their effects on cerebral oxygenation have not been investigated in the mild hypercapnia period well enough yet. Therefore, we examined the effects of propofol and sevoflurane anaesthesia on rSO2 during normocapnia and mild hypercapnia period on patients undergoing laparoscopic cholecystectomy. With Ethics Committee approval and informed consent, 60 patients, ASA I–II, 18–65 yr were recruited. They received a remifentanil infusion at a rate of 0.3 μg kg\(^{-1}\) min\(^{-1}\), and were randomized into two equal groups. Haemoglobin concentrations did not differ between the groups. For the induction and the maintenance of anaesthesia, sevoflurane (vital capacity breathing with 8% sevoflurane 6 litre min\(^{-1}\) airflow of 100% oxygen induction) and propofol (2 mg kg\(^{-1}\), 3 μg ml\(^{-1}\) target plasma concentration) were used in Group SR and in Group PR, respectively. Rocuronium 0.6 mg kg\(^{-1}\) was administered to facilitate tracheal intubation. For the maintenance of anaesthesia, sevoflurane concentration was changed by 0.2% and the target plasma concentration of propofol was changed by 0.5 μg ml\(^{-1}\) to maintain BIS values at 40–50. Vital signs (Datex Ohmeda SS) and rSO2 (INVOS 5100) were measured before (baseline) and after anaesthesia induction, immediately after low pressure (8 mm Hg) and high pressure (15 mm Hg) CO2 pneumoperitoneum, every 5 min during CO2 insufflation, and every 1 min during the hypercapnia period (end-tidal carbon dioxide tension 6–7.3 kPa). The lungs were mechanically ventilated with a mixture of oxygen and air. When hypercapnia occurred, minute ventilation was increased to maintain normocapnia. Parametric data were analysed by repeated-measures analysis of variance and the Student’s t-test for multiple comparisons where appropriate. Non-parametric data were...
analysed by the Mann–Whitney U-test. There were no statistically significant differences in patient characteristic variables between the groups. After intubation and skin incision, right and left rSO₂ values were found to be significantly higher in Group PR than in Group SR (P<0.05). When intra-abdominal pressure was 8 mm Hg, the increase in the right and left rSO₂ values was significant in Group PR, when compared with Group SR (P<0.05). Haemodynamic parameters and SP₀₂ values were not associated with these changes because they did not differ between the groups at all time periods (P>0.05). The incidence of cerebral desaturation (more than 20% decreases from baseline) was not observed. In addition, no significant difference was observed between the groups in terms of haemodynamic parameters and rSO₂ values during hypercarbia (P>0.05).

In conclusion, the effects of equipotent BIS doses of propofol and sevoflurane are associated with similar rSO₂ values during normocapnia and mild hypercarbia. However, in the periods in which stimulus is intense, propofol anaesthesia increased the rSO₂ values when compared with sevoflurane anaesthesia likely caused by decreased cerebral metabolic rate of oxygen consumption and therefore reduced oxygen requirements.

**Declaration of interest**

None declared.

P. Sen
S. Izdes*<br>A. But<br>Ankara, Turkey  
*E-mail: sevalizdes@yahoo.com


5 Yamada N, Nagata H, Sato Y, Tomoyasu M. Effects of propofol or sevoflurane on cerebral regional oxygen saturation (rSO₂) during one-lung ventilation. Masui 2008; 57: 1388–97


**Ultrasound-guided anterior sciatic nerve block in the proximal thigh: an in-plane approach improving the needle view and respecting fascial planes**

Editor—The anterior approach to the sciatic nerve (SN) is an ergonomic method of providing anaesthesia of the lower limb in combination with a femoral nerve block. The SN in the proximal thigh is located medial to the femur in the fascial plane between the adductor magnus and gluteal muscles. Ultrasound-guided (USG) anterior SN block is often undertaken using an in-plane (IP) approach in which a needle is advanced from a position immediately medial or lateral to a curvilinear, low-frequency (2–5 MHz) transducer (Fig. 1). This steep insonation angle often prevents a clear view of the needle tip as the SN is approached at an average depth of up to 10 cm (Fig. 1). Furthermore, this needle trajectory passes through the adductor muscle group, close to the major vessels of the lower limb and the obturator nerve (ON) (Fig. 1). An alternative IP anterior approach to the SN in the proximal thigh which improves the needle view and avoids the major neurovascular structures is described. With the hip abducted and the knee flexed, the SN is identified in the proximal thigh using a 2–5 MHz curvilinear transducer (C60, Sonosite, Bothell, WA, USA). A measurement is taken from the skin to the SN viewed in the middle of the ultrasound (US) image. The needle enters the skin on the medial aspect of the thigh at this distance immediately below the midpoint of the transducer in the plane of the US beam and advanced towards the SN (Fig. 2). This needle trajectory is almost perpendicular to the US beam as the SN is approached, thus enhancing visualization of the needle tip and accuracy of local anaesthetic deposition (Fig. 2). The medial to lateral needle trajectory also avoids the femoral vessels and the profunda femoral vessels running between the femur and the lateral aspect of the SN. Although colour probe Doppler may help identification of these vessels, it is not infallible and is limited by technical factors, including blood viscosity, transducer frequency, and insonation angle. This USG approach to the SN described here has been successfully undertaken in 120 patients with a mean age and BMI of 64.7 yr (SD 11.3) and 31.8 (SD 5.8), respectively. The SN block was completed within a mean time of 4 min 32 s (SD 1 min 52 s). The minimum threshold current for SN stimulation was 0.33 mA (SD 0.08). Vascular puncture was avoided in all cases. US identification of the SN can be difficult to visualize in some patients. USG deposition of local anaesthetic in a fascial plane has recently been described to block the ON in the proximal thigh. The needle trajectory described here respects the fascial plane between the adductor magnus and gluteal muscle groups, offering an alternative method for placement of local anaesthetic when the SN is not clearly visible. The USG anterior approach to the SN remains challenging. Enhancing the needle view, avoiding major vasculature, and utilizing the available tissue planes...