symptoms: onset 4 days after lumbar puncture and resolution within hours after treatment in our patient vs 4 weeks until onset and several days until remission with treatment in theirs. The imaging findings were unremarkable in our patient, whereas several findings, including downward displacement of the brainstem, were identified in their patient. Based on the findings in these cases, we conclude that (i) psychiatric symptoms can be associated with CSF leakage and (ii) the clinical and radiological aspects of the cases can vary.

**Declaration of interest**

None declared.

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**Reply from the authors**

Editor—We read with great interest the report by Dr Y. Kakisaka and colleagues of a paediatric case similar to ours.1 Their report highlights the fact that post-dural puncture headache is not always characterized by orthostatic headache associated with neck stiffness, tinnitus, hypoacusia, photophobia, or nausea.2 Clinical presentation can sometimes be atypical and patients can present with neuropsychiatric symptoms. The diagnosis may be particularly difficult to make. Computed tomography scan is of limited value for the diagnosis of the perforation as illustrated in their report. Sometimes, images of a subdural fluid collection, obliteration of subdural cistern, and ventricular collapse can be seen and suggest an intracranial hypotension, but this is not always the case.3 Cranial magnetic resonance imaging (MRI) with gadolinium injection is the radiological test of choice. Images will show a diffuse dural pachymeningeal enhancement, reflecting the presence of small thin-walled dilated blood vessels in the subdural space.4 We would therefore recommend prompt neurological evaluation (cranial MRI with contrast injection) for patients who present with neuropsychiatric symptoms after dural perforation.

**Declaration of interest**

None declared.

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**Failure of esmolol to control tachycardia associated with thyroid storm after subtotal thyroidectomy**

Editor—Thyroid storm is a potentially life-threatening disorder marked by fever, sweating, and tachycardia. It usually requires treatment with β-blocker. Esmolol, a cardio-selective β-blocker, has been shown effectively to control tachycardia in patients with thyroid storm.1 2 Here, we describe a case in which esmolol therapy did not control sinus tachycardia in a postoperative patient with thyroid storm.

A 33-yr-old, 56 kg Chinese female had progressive swelling in the neck for 7 yr. She had been diagnosed with hyper-thyroidism 4 yr previously. Because of medical treatment failure, subtotal thyroidectomy was performed under general anaesthesia using propofol and sufentanil infusions. Anaesthesia and surgery were uneventful, and the patient was transferred to the recovery room. After 30 min, she regained consciousness and adequate respiratory strength. However, she was febrile (38.6°C), restless, and had profuse sweating despite adequate analgesia. Arterial pressure was 156/107 mm Hg and an ECG showed a sinus tachycardia (152 beats min⁻¹). As thyroid storm was suspected, esmolol 30 mg was given i.v. over 1 min, followed by midazolam 5 mg. Ice packs and alcohol sponging were used to lower body temperature, methimazole 20 mg was given by the nasogastric tube, and hydrocortisone 100 mg and nicardipine 0.25 mg were administered i.v. After 20 min, the temperature had decreased to 37.4°C, but tachycardia and hypertension persisted. A further dose of esmolol 30 mg was given, followed by an infusion at an initial dose of 50 μg kg⁻¹ min⁻¹, titrated up to 300 μg kg⁻¹ min⁻¹ (the maximum recommended dosage) over a 50 min period. However, the patient remained tachycardic and hypertensive. At that time, no signs and symptoms of congestive
heart failure were detected. Thyroid function test revealed FT4 of 26 pmol litre\(^{-1}\) (normal 11–22 pmol litre\(^{-1}\)), FT3 of 8.9 pmol litre\(^{-1}\) (normal 3.1–6.8 pmol litre\(^{-1}\)), and TSH of 0.005 mIU litre\(^{-1}\) (normal 0.465–4.68 mIU litre\(^{-1}\)).

Tracheal extubation was performed in order to remove the stimulation of a tracheal tube. The patient was transferred to the intensive care unit, where she was treated with hydrocortisone, propylthiouracil, and iodine. On advice from a cardiologist, the esmolol infusion was discontinued, and diltiazem was continuously administered at a rate of 5–10 mg h\(^{-1}\) after a 20 mg bolus injection. After 10 h of treatment, her condition began to stabilize, heart rate decreased to 92 beats min\(^{-1}\), and all symptoms relieved. The remainder of her hospitalization was uneventful and she was discharged on the 5th postoperative day in a healthy state.

Thyroid storm is usually precipitated by surgery, trauma, ketoacidosis, or infection. Its underlying mechanisms are not fully understood. An increased number of \(\beta\)-adrenergic receptors on target organs may contribute to hyperresponsiveness to catecholamines. This patient appeared to be insensitive to \(\beta\)-blocker. This may be due to abnormalities in the properties and number of \(\beta\)-adrenergic receptors in the heart. An increased dose of \(\beta\)-blocker may be required in these patients, but the underlying causes of insensitivity are still to be determined.

Declaration of interest
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Rotational vertigo and nystagmus rapidly after an intrathecal block with bupivacaine and fentanyl

Editor—We report a case who developed rotational vertigo and horizontal nystagmus 5 min after intrathecal block with bupivacaine and fentanyl. The symptoms completely resolved after 70 min.

A 64-yr-old man (height 180 cm; weight 80 kg) was scheduled for elective total hip arthroplasty due to osteoarthritis. The patient was otherwise healthy, with no current medications or allergies. Spinal anaesthesia was chosen for the surgery. In the sitting position, after preparation with chlorhexidine alcohol solution and lidocaine infiltration of the skin at the L3–4 level, a 25 G pencil-point (Portex\(^{\text{®}}\), Smiths Medical, USA) spinal needle was inserted in the L3–4 interspace. Clear liquor, without any trace of blood, was observed and 2.8 ml isobaric bupivacaine 0.5% (Marcain\(^{\text{®}}\), Spinal, Astra Zeneca, Sweden) and 0.4 ml fentanyl 50 \(\mu\)g ml\(^{-1}\) (Fentanyl\(^{\text{®}}\), B. Braun, Germany) were given. The patient experienced no pain or paresthesia during the placement of the needle or injection of the drug. The patient was then placed in the right lateral position. About 5 min later, the patient experienced severe rotational vertigo. Bilateral horizontal nystagmus was observed. The systolic arterial pressure decreased from 110 to 66 mm Hg. Ephedrine 10 mg was given with a rapid recovery of the arterial pressure to 130/70 mm Hg. The patient had normal sensory perception and strength in his upper extremities. The surgery was cancelled due to the continued horizontal nystagmus and vertigo. The patient was taken to the post-anaesthesia care unit (PACU) for observation. In the PACU, arterial pressure was 140/75 mm Hg, respiratory rate 13 bpm, saturation 100%, haemoglobin 12.2 g dl\(^{-1}\), and troponin T was negative. ECG was normal as was a computed tomography scan of the head without contrast. Neurological examination was normal above the T4 level except for the horizontal nystagmus and rotational vertigo. The nystagmus and vertigo were not related to the body position. The symptoms gradually resolved and had completely disappeared after about 70 min. The motor function in the lower extremities recovered after a couple of hours and showed Bromage of 0. Two weeks after this, the patient underwent an uneventful elective total hip arthroplasty under general anaesthesia.

NAP3 in the UK found the incidence of permanent harm after spinal anaesthesia to be 1.6–2.6:100 000. Complications associated with intrathecal opioid administration include nausea, vomiting, pruritus, and urinary retention. Neurological complications are rare, although vertical nystagmus after epidural opioids has been reported. Small doses of epidural opioids have been reported to cause vestibular dysfunction. Impaired auditory function is a relatively lesser recognized complication of spinal analgesia. Downbeat nystagmus, nausea and vomiting 10 h after preoperative intrathecal administration of bupivacaine and morphine have been described. The symptoms spontaneously disappeared after 24 h. A 43-yr-old woman undergoing Cesarean section developed rotational vertigo and horizontal nystagmus 3.5 h after spinal anaesthesia injection with tetracaine HCl and morphine HCl. After two doses of naloxone 0.1 mg, the nystagmus disappeared.

Nystagmus and rotational vertigo rapidly after an intrathecal injection of bupivacaine and fentanyl has not been reported previously. Possible mechanisms include bupivacaine or opioid central nervous system toxicity, a vestibular

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