TABLE Comparison of frequency of complications our study group with previous study

	Group I (n = 6) (%)	Group II (n = 20) (%)
Intraoperative		
1. MBP decrease >30%	0	10
2. Nausea, vomiting	0	55
3. Drowsiness	0	70
4. Respiratory depression	0	5
5. Bronchospasm	0	5
Postoperative		
1. Urinary retention	0	30
2. Mild headache	0	25
3. Nausea, vomiting	0	30
4. Pruritus	33	10

Group I = Maimonides Med. Ctr.
Group II = Sangarlangkarns, *et al.*

high incidence of adverse effects such as nausea, vomiting, pruritus, drowsiness, respiratory depression, bradycardia and hypotension documented in earlier studies[2] may have been due to the high doses used. By reducing the dosage to 0.5 $mg \cdot kg^{-1}$, we were able to provide minimal side effects, yet retain anaesthetic potency and good operative conditions. The early hypotension observed in one patient appears to have been due to sympathetic blockade even with this low dose.

In conclusion, meperidine 0.5 $mg \cdot kg^{-1}$ spinal anaesthetic appears to be efficacious, and an acceptable alternative in the elderly ASA physical status II–IV orthopaedic patients scheduled for lower limb surgery. The postoperative analgesia, absence of motor paralysis at the end of surgery and haemodynamic and respiratory stability are important characteristics of this anaesthetic technique.

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Intra- and postoperative management of craniosynostosis

To the Editor:
We read with interest the paper by Kerney *et al.*[1] In order to provide additional information on this interesting topic, we would like to present our experience concerning the intra- and postoperative management of patients affected by craniosynostosis.

Since 1984 we have treated 45 patients for surgical correction of craniosynostosis. Their ages ranged from 1.5 to 24 mth and body weight from 3 to 14 kg. The sutures involved were sagittal (29 cases), unicoronal (9), metopic (3), bicoronal (3), and all sutures (1). The surgical technique varied depending on the craniosynostosis type. It was not limited to reopening of closed sutures but craniectomies were extended to the skull base to promote the simultaneous growth of both the base and vault bones.

Intraoperative monitoring included ECG, auscultation of breath sounds, rectal temperature, invasive measurement of blood pressure, intermittent arterial blood gas analysis, and haematocrit (Hct). The radial artery was cannulated in 18 patients, and femoral artery in 24 patients by a 22 G catheter. The arterial cannula was removed one hour after the end of the surgical procedure. In the postoperative period Hct, a simplified coagulation profile (prothrombine time, platelet count), and serum electrolytes (Na, K, Cl) were evaluated.

In order to reduce blood loss during the procedure, mild hypotension (10–15 mmHg below basal systolic pressure) was induced using volatile anaesthetic agents. The blood volume was estimated to be 80 $ml \cdot kg^{-1}$ body weight. As a rough guide, warmed packed blood cells were transfused when blood loss was more than 15 per cent of the estimated blood volume (EBV) and additionally fresh frozen plasma was administered after a loss of 30–35 per cent of the EBV.

Forty-three of 45 patients were transfused intraoperatively. The mean blood loss was estimated to be 44 per cent (range 15–82 per cent). More than 60 per cent of the EBV was replaced in seven patients and ten patients received fresh frozen plasma along with packed red blood cells. As a result of bleeding four patients developed marked hyptension and metabolic acidosis (systolic blood pressure below 50 mmHg; pH 7.15 ± 0.01) during the intraoperative period.

Due to the difficulty in evaluating blood loss and fluid requirements in this kind of surgery, at the end of the surgical procedure Hct exhibited a significant, although

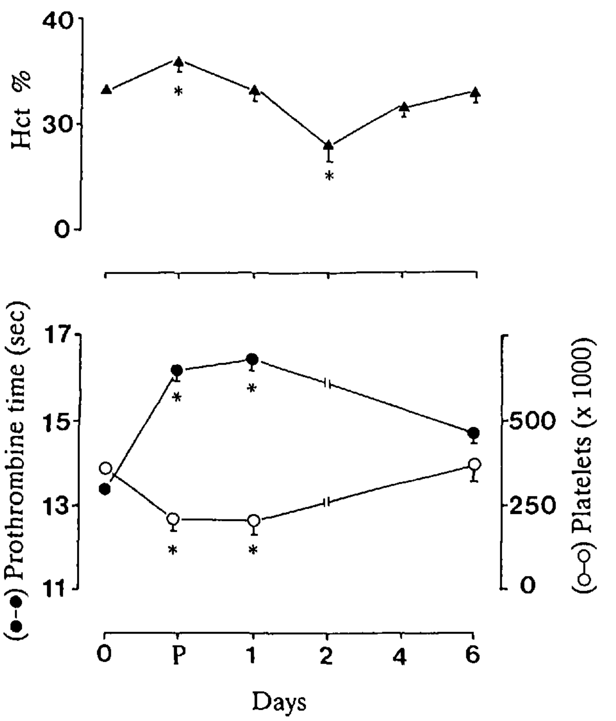

FIGURE Changes in haematocrit (Hct), platelet count and prothrombine time (mean ± SEM). $*P < 0.05$ Student's paired t test. 0 = preoperatory; *P* = postoperatory.

unintentional, increase in almost every patient. The Hct decreased on the second postoperative day and returned to the baseline level six days later (Figure). Prothrombin time was prolonged and platelets were moderately reduced at the end of surgery and the following day (Figure). There were no relevant changes in the serum electrolytes at any time.

A few hours after the end of the surgical procedure, two patients experienced hypovolaemic shock, which was immediately corrected by infusion of fluids, bicarbonate, and calcium gluconate. Four infants were transfused in the postoperative period. There were no complications related to arterial catheterism nor perioperative deaths.

The majority of our patients (95 per cent) had to be transfused intraoperatively and the principal problems we experienced were connected with blood loss. In agreement with other authors,[2,3] we recommend the use of short term arterial catheterization which allows blood-gas analysis, continuous measurement of blood pressure, and easy sampling for serial Hct determination. The last two variables together represent a reliable index for blood transfusion and fluid replacement in small children.[4] In the postoperative period strict surveillance of vital signs and Hct is mandatory. Although coagulation disorders did not occur as a result of surgery in this study, monitoring of coagulation indices is also necessary in large mass blood replacement.[3,5]

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REPLY

We would like to thank Dr. Imberti and colleagues for providing more information on this infrequently addressed topic. Their figures for blood loss, though greater than in our study (28 per cent of estimated blood volume (EBV) overall) are in keeping with one other study.[2] The facts that 95 per cent of their patients required blood transfusions, nine per cent developed severe metabolic derangements secondary to blood loss, and four per cent developed hypovolaemic shock postoperatively, underline the importance of blood and fluid management of these patients.

Our study showed significant differences in blood loss between single suture craniectomies (sagittal or unicoronal) and multiple suture or metopic craniectomies. It would have been of interest to know this breakdown for their data. Sagittal craniectomies constitute the vast majority of cases, and blood loss during this procedure has generally been found to be less than 25 per cent of EBV[1,3,4] (although in one study as high as 40 per cent of EBV[2]). The type of operative procedure may account for this difference as surgical approaches vary among institutions. We feel that patients with simple sagittal synostosis represent a lower risk group for perioperative complications and agree with others[3] that invasive monitoring is not warranted in this group. For multiple suture craniectomies, invasive monitoring is advantageous.