

Challenges for Clinicians 2010

Interactive session #3

Moderator: Dr. Tung

Discussants:

Dr. O'Connor

Dr. Tung

Dr. Zafirova

Dr. Woo

A 71 yr F presents for a T11 thoracic laminectomy (with nerve monitoring) for tumor resection

She has a history of R breast CA treated 10 years ago with mastectomy and chemotherapy. She had been symptom free until 3 months ago when she noticed chest and back pain. Rapid contrast CT scanning of her heart found no coronary artery disease but did identify a lesion in her T11 vertebra. Biopsy of the lesion demonstrated adenocarcinoma of unknown origin.

Her past medical history includes hypertension treated with Vasotec and a pacemaker placed for idiopathic bradycardia. Past surgical history includes a C/S in addition to her thoracotomy. She has no allergies, and is taking no other medications. She has no cardiorespiratory symptoms, and can walk several miles without difficulty. She has no coronary artery disease on CT scan. During preoperative workup 11 days ago, her internist noted R calf swelling and warmth. A doppler examination revealed a DVT and she was placed on Lovenox.

In the preop holding area she is in no pain, or cardiorespiratory distress. BP 130/90, HR 80. She reports no limitation in exercise tolerance. On examination her right calf appears normal. She has taken her Lovenox for 9 days (but stopped it two days ago).

1. Would you cancel the case due to inadequate DVT treatment?

Although she has been on Lovenox for 9 days and is now asymptomatic, her risk of periooperative PE is still high. Moreover, with such an involved case the likelihood of a prolonged postoperative course (and thus risk of postoperative PE is greater). Few data exist to define the ideal duration for perioperative DVT treatment. Consensus guidelines, however, generally recommend 1 month.

Kearon C, Hirsh J. Management of anticoagulation before and after elective surgery. *NEJM* 1997;336:1506-11

Douketis JD, Gu CS, Schulman S, Ghirarduzzi A, Pengo V, Prandoni P. The risk for fatal pulmonary embolism after discontinuing anticoagulant therapy for venous thromboembolism. *Ann Intern Med.* 2007;147(11):766-74

Prandoni P, Noventa F, Ghirarduzzi A, Pengo V, Bernardi E, Pesavento R, Iotti M, Tormene D, Simioni P, Pagnan A. The risk of recurrent venous thromboembolism after discontinuing anticoagulation in patients with acute proximal deep vein thrombosis or pulmonary embolism. A prospective cohort study in 1,626 patients. *Haematologica*. 2007 Feb;92(2):199-205.

Kaufman JA, Kinney TB, Streiff MB, Sing RF, Proctor MC, Becker D, Cipolle M, Comerota AJ, Millward SF, Rogers FB, Sacks D, Venbrux AC. Guidelines for the use of retrievable and convertible vena cava filters: report from the Society of Interventional Radiology multidisciplinary consensus conference. *J Vasc Interv Radiol*. 2006 Mar;17(3):449-59

Decousus H, Leizorovicz A, Parent F, Page Y, Tardy B, Girard P, Laporte S, Faivre R, Charbonnier B, Barral FG, Huet Y, Simonneau G. A clinical trial of vena caval filters in the prevention of pulmonary embolism in patients with proximal deep-vein thrombosis. Prévention du Risque d'Embolie Pulmonaire par Interruption Cave Study Group. *N Engl J Med*. 1998;338:409-15.

You disclose the risks and benefits to the patient who clearly wishes to proceed. In the discussion you realize that perioperative blindness has not been disclosed as a potential complication by the surgeon. A chat with the surgeon confirms your suspicion. The surgeon states that he has never had a case of postoperative visual loss (in 15 years!), notes that the patient is extremely healthy at baseline, anticipates a short 2 hour case, and emphasizes that without the surgery her cancer will likely spread.

2. Do you disclose the risk of blindness to the patient?

Although the likelihood of blindness during prone spine surgery is low, causes, risk factors, and mechanisms underlying postoperative visual loss are poorly understood. In addition, hypothesized risk factors such as intraoperative anemia and hypotension may be more likely in this patient because of the complexity of her surgery and her recently discontinued Lovenox. Finally, the surgeon has made it clear he considers the risk of postoperative visual loss to be too low to disclose.

Katz DM, Trobe JD, Cornblath WT, Kline LB. Ischemic optic neuropathy after lumbar spine surgery. *Arch Ophthalmol*. 1994;112:925-31

Lofsky AS, Gorney M. Ischemic Optic Neuropathy in Spine cases. *APSF Newsletter* Summer 1998. Accessed online at:

http://www.apsf.org/resource_center/newsletter/1998/summer/07hypot.html

Dunker S, Hsu HY, Sebag J, Sadun AA. Perioperative risk factors for posterior ischemic optic neuropathy. *J Am Coll Surg*. 2002;194:705-10

Lee LA. ASA Postoperative Visual Loss Registry: Preliminary Analysis of Factors Associated With Spine Operations. *ASA Newsletter* June 2003;67:6, accessed at:

http://www.asahq.org/Newsletters/2003/06_03/lee.html

American Society of Anesthesiologists Task Force on Perioperative Blindness. Practice advisory for perioperative visual loss associated with spine surgery: a report by the American Society of Anesthesiologists Task Force on Perioperative Blindness. *Anesthesiology*. 2006 Jun;104(6):1319-28

Shen Y, Drum M, Roth S. The prevalence of perioperative visual loss in the United States: a 10-year study from 1996 to 2005 of spinal, orthopedic, cardiac, and general surgery. *Anesth Analg*. 2009 Nov;;1534-45.

You (finally) convince the surgeon to disclose the risk and both of you discuss the risk with the patient. She again accepts the risk of proceeding. Induction, intubation, and arterial line placement are straightforward.

With her history of R mastectomy 10 years ago you attempt to place a triple lumen CVP catheter in her L internal jugular vein for volume monitoring purposes. After 3 attempts with and without ultrasound, however, you cannot pass the wire more than 8cm, likely due to the presence of pacemaker wires.

3. Would you place the CVP catheter in her R internal jugular vein, do the case without the monitor, or choose the femoral site?

The history of breast CA argues against any venous access on the side of her prior mastectomy. The surgeon does not anticipate massive blood loss. But the patient was receiving Lovenox as late as two days ago. She will also be prone for the procedure, making intraoperative CVP placement difficult and potentially compromising assessment of volume status.

Pain SJ, Purushotham AD. Lymphoedema following surgery for breast cancer. *Br J Surg*. 2000;87:1128-41

Park JH, Lee WH & Chung HS (2008) Incidence and risk factors of breast cancer lymphoedema. *J Clin Nurs* 2008;17:1450–9

Stanton AW, Holroyd B, Northfield JW, Levick JR, Mortimer PS. Forearm blood flow measured by venous occlusion plethysmography in healthy subjects and in women with postmastectomy oedema. *Vasc Med*. 1998;3(1):3-8.

Norman SA, Localio AR, Potashnik SL, Simoes Torpey HA, Kallan MJ, Weber AL, Miller LT, Demichele A, Solin LJ. Lymphedema in breast cancer survivors: incidence, degree, time course, treatment, and symptoms. *J Clin Oncol*. 2009 Jan 20;27(3):390-7.

You decide to place a CVP catheter in the right internal jugular vein. Her initial CVP is 12 cm H₂O

4. Would you place a bite block?

Both sensory and motor nerve monitoring are planned for this patient. Case reports suggest the potential for tongue lacerations due to repeated masseter stimulation during prone surgery. However, the tongue block may become malpositioned during surgery, and may even cause numbness from continuously pressing on lingual nerves during the case.

Macdonald DB. Intraoperative motor evoked potential monitoring: overview and update. *J Clin Monit Comput.* 2006;20:347-77.

MacDonald DB. *J Clin Neurophysiol.* 2002;19:416-29. Safety of intraoperative transcranial electrical stimulation motor evoked potential monitoring.

Mahmoud M, Spaeth J, Sadhasivam S. Protection of tongue from injuries during transcranial motor-evoked potential monitoring. *Paediatr Anaesth.* 2008;18:902-3.

Takasaki Y. Transient lingual ischaemia during anaesthesia. *Anaesthesia.* 2003;58:717

You place a tongue block. The patient is turned prone and the case begins. 2 hours later, she has lost 500cc and you have given 2500cc LR. The surgeon notes that the lesion is larger than the CT scan suggested and advises you that the procedure will take several hours longer than anticipated. The blood pressure now sags to 105/55. HR 88, SpO₂ 100% on 100% FiO₂. CVP is unchanged (10cm H₂O) but pulse pressure variation is 10mmHg. Arterial blood gas is 7.36, pCO₂ 35, PO₂ 130 on 100% FiO₂

5. Would you give fluid, start a vasopressor, or leave the blood pressure where it is?

Although the blood pressure is within the normal range, the patient has hypertension at baseline. In addition, hypotension is suspected, but not proven contributor to postoperative visual loss. By bookkeeping criteria, you have given enough fluid to compensate for her blood loss, and her CVP is consistent with an adequate volume state. In addition, her PO₂ suggests the beginnings of mild pulmonary edema. Volume status may be difficult to assess in the prone position, however, and her pulse pressure variation suggests that her blood pressure may increase with additional fluid.

Marik PE, Baram M, Vahid B. Does central venous pressure predict fluid responsiveness? A systematic review of the literature and the tale of seven mares. *Chest.* 2008;134:172-8.

Preisman S, Kogan S, Berkenstadt H, Perel A. Predicting fluid responsiveness in patients undergoing cardiac surgery: functional haemodynamic parameters including the Respiratory Systolic Variation Test and static preload indicators. *Br J Anaesth.* 2005;95:746-55.

Marks JD. Cardiovascular monitoring. In: Miller RD (ed) *Miller's anesthesia* 6th edition Elsevier 2004.

Donahue SP, Wood JP, Patel BM, Quinn JV. Correlation of sonographic measurements of the internal jugular vein with central venous pressure. Am J Emerg Med. 2009;27(7):851-5.

But she was On preop

After a 250cc bolus of albumin, her blood pressure does not change. You start a neosynephrine drip to keep MAP >70mmHg. 3 hours later, the case concludes. You flip the patient supine, extubate her, and bring her to the PACU awake, interactive, and pain-free. In the PACU she looks at you and says 'see, I knew I wouldn't go blind!'