**Massive postoperative pulmonary embolism in a young woman using oral contraceptives: The value of a preoperative anesthetic visit**

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CLINICAL CASE

A 45-years old woman with a history of hypothyroidism, overweight (BMI 27.9 kg/m2) and active tabagism (20-60 cigarettes per week) presented at the neurosurgery consultation for incapacitating lumbar radicular pain. The lumbosacral spine tomodensitometry showed severe spinal L5-S1 and right foraminal L4-L5 stenosis, as well as moderate left L4-L5 stenosis, due to a bilateral spondylolysis of L4 and L5, grade III antelisthesis of L5 and grade I antelisthesis of L4. Following patient informed consent, the decision to perform a transforaminal lumbar interbody fusion (TLIF) was made.

At the preoperative anesthetic visit, 8 days before surgery, the patient complained of bilateral sciatic pain with normal leg flexibility. She had no other symptoms. She was on a thiazide diuretic, and on a combined oral contraceptive containing ethinyloestradiol and drospirenone (Yasmin®). Cardiopulmonary examination was normal. No preoperative coagulation testing was performed as she had normal testing two years earlier.

Upon arrival in the operating room, the patient wore compression stockings. The intervention took place in the prone position. Surgery lasted more than 8 hours, and was uneventful. At the end of the procedure, the patient was turned back into the supine position, and the endotracheal tube was removed without any problems.

Six minutes after arrival in the post-anesthesia care unit, the patient presented cardiac arrest. Cardiopulmonary resuscitation started immediately, with a no-flow time equal to 0. Uninterrupted chest compressions, endotracheal intubation, as well as arterial line and central venous catheter insertion were performed. Return of spontaneous circulation was observed with a low-flow time equal to 25 minutes. However, the patient remained hemodynamically unstable. Despite vascular filling, a total dose of 10 mg of epinephrine, and external cardiac compressions, no effective circulation could be restored. A transesophageal echocardiography was then realized, showing a massive thrombus invading the right atrium and right ventricle.

The patient was transferred to the cardiac surgery operating room and cardiopulmonary bypass was initiated 76 minutes after the initial cardiac arrest. The thrombus was surgically removed. After surgery completion and due to the impossibility to wean off cardiopulmonary bypass, extracorporeal life support was initiated. At that moment, the patient showed clinical and biological signs of disseminated intravascular coagulation, and necessitated massive transfusion, as well as neurosurgical revision for hemostasis in the left lateral position.

During cardiac surgery, the bilateral electro-encephalogram (EEG) obtained by the cerebral monitor NeuroSENSE® remained isoelectric for 1 hour.

During the postoperative period, electroencephalography and smoatosensory evoked potentials were performed, showing absence of any cortical activity. In agreement with the family, the extracorporeal life support was stopped and comfort care was established. The patient died on the third postoperative day.

## DISCUSSION

The occurrence of deep venous thrombosis has been associated with the consumption of combined oral contraceptives (l, 2). The risk is even increased in the presence of other risk factors such as tabagism, obesity, coagulation abnormalities, family history, and hypothyroidism (3).

In this regard, the oral ethinyloestradiol and drospirenone containing contraceptive Yasmin® has been the subject of several publications, suggesting an increased risk of deep venous thrombosis (4 , 5) and pulmonary embolism (5, 6). Moreover, its combination with tobacco consumption seems devastating (3). However, other studies could not show any significant difference between oral contraceptives with or without drospirenone with regard to the occurrence of deep venous thrombosis (7).

Our patient had suffered for several months from bilateral sciatic pain, and was therefore limited in her daily physical activities.
The huge thrombus discovered by transesophageal echocardiography pleads in favor of already existing deep venous thrombosis, long before surgery. In this active smoking patient, with chronic Yasmin® intake, and very limited physical activity, a preoperative leg doppler ultrasonography would have probably detected deep venous thrombosis. Discontinuation of oral contraception, and, if possible, of smoking should have been discussed with the patient at the moment of the preoperative visit. There are currently no studies evaluating the eventual benefits of stopping oral contraceptives before surgery. However, stopping oral contraceptives and replacement estrogens three weeks before surgery to two weeks after has been proposed by some cosmetic surgeons (8). In our case, stopping oral contraception sounds wise, considering her risk factors and the planned type of surgery.

This case-report is also an illustration that patients undergoing elective spine surgery are at risk of deep venous thrombosis and pulmonary embolism, despite the use of mechanical prophylaxis such elastic stockings. This has been illustrated in a retrospective study in patients undergoing elective spine surgery (9). Indeed, mechanical prophylaxis and early ambulation reduce the risk of symptomatic pulmonary embolism, without eliminating it.

In this regard, the North American Spine Society (NASS) Evidence-Based Guideline on anti-thrombotic therapies in spine surgery consider the use of mechanical prophylaxis as reasonable practice, but literature does not contain any randomized studies addressing this issue (10).

Therefore, a complete preoperative evaluation of patients at high risk of deep venous thrombosis is mandatory. Any risk factors that can possibly be eliminated prior to surgery should be considered and discussed with the patient.

**Comment [BV1]:** What about the use of intermittent compressive devices, scuh as the Kendall device ?

CONCLUSION

This case-report emphasizes the value of a preoperative anesthetic visit. In patients at high risk of deep venous thrombosis and undergoing major surgery, discontinuation of oral contraceptives should be considered. A doppler ultrasonography may be justified to exclude the presence of a pre-operative deep venous thrombosis. Large scale studies are still need to address these issues formally.

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