Importance of secretion pattern in minimally invasive surgery for phaeochromocytoma

We appreciate the paper of Weismann et al. comparing intraoperative haemodynamic stability in patients undergoing phaeochromocytoma removal by the minimally invasive approach vs. the conventional open surgery. The authors demonstrated in a retrospective study that there is no significant difference in haemodynamic stability between minimally invasive approach and conventional open surgery during surgery for phaeochromocytoma. Less surprising is the fact that intraoperative haemodynamic parameters were much more unstable for phaeochromocytoma compared to adrenocortical adenomas. These results are in line with a previous study in which we demonstrated in eight patients the safety and the efficiency of laparoscopic adrenalectomy to remove phaeochromocytomas including even large-sized lesions (more than 10 cm in diameter).

However, we want to stress other important aspects of the complexity of the pre- and intraoperative blood pressure control for phaeochromocytoma surgery. First, the authors unfortunately did not present any information about haemodynamic differences that possibly could have been linked to the choice of the type of minimally invasive approach: either transabdominal (requiring peritoneal insufflation) or retroperitoneal (requiring a prone position of the patient). As far as intraoperative haemodynamic stability is concerned, the preference of the responsible surgeon is not the final word, as inferred by the authors. Indeed, results of intraoperative blood pressure monitoring show that hypertensive peaks during phaeochromocytoma surgery could be induced by patient positioning on the operating table, peritoneal insufflation and/or tumour manipulation and occur concomitantly with a release of catecholamines and other hormones endowed with vasoactive properties.

Second, the predominant preoperative catecholamine secretion pattern is important to know. Indeed, in our previous study, the greatest haemodynamic instability was observed in noradrenaline secreting phaeochromocytomas probably as a result of the more pronounced vasoconstrictor effects of this amine through binding to alpha-receptors. Of note, we could also establish a relationship between tumour size and the type of catecholamine secretion. Tumours smaller than 30 mm in diameter predominantly secreted adrenaline whereas larger ones mainly secreted noradrenaline. This could be explained by the fact that large phaeochromocytomas are devoid of sufficient cortisol supply for phenylethanolamine-N-methyltransferase induction and hence adrenaline synthesis.

Third, because phaeochromocytomas can provoke severe cardiomyopathy as well as myocarditis, one may raise the question of the safety of laparoscopic surgery in these life-threatening presentations of phaeochromocytoma. We encountered such a case in a 23-year-old woman presenting with malignant hypertension and acute heart failure. After blood pressure stabilization and treatment of pulmonary oedema, a 5-cm phaeochromocytoma secreting noradrenaline was removed laparoscopically. Intraoperative hypertensive peaks were mainly observed at the time of peritoneal insufflation and tumour manipulation. After surgery, the follow-up revealed a recovery of cardiac function. This case thus illustrates that minimally surgery is possible in life-threatening phaeochromocytoma after careful haemodynamic stabilization.

Finally, it is interesting to mention that other hormones with vasoactive properties, such as atrial natriuretic factor and neuropeptide Y, are released in parallel with catecholamines during phaeochromocytoma surgery and can exert haemodynamic effects.

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