

Anatomical and surgical insights for hypogastric nerves preservation during pelvic retroperitoneal dissection

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During several gynecological retroperitoneal pelvic surgeries, portions of the pelvic autonomic nervous system can be accidentally damaged, in particular hypogastric nerves, leading to significant visceral dysfunctions, dramatically affecting woman's quality of life. The aims of this study were to clarify the relationship of hypogastric nerve with definite anatomical landmarks and to assess any anatomical differences between the two sides of the pelvis.

Detailed pelvic retroperitoneal dissection was performed in 5 nulliparous embalmed female cadavers and in 10 nulliparous women during *in vivo* laparoscopic surgery for rectosigmoid endometriosis without parametrial infiltration or radical hysterectomy (B1 according to Querleu-Morrow) for cervical cancer. On both hemipelvis, the closest distance between HNs and ureters, midsagittal plane, midcervical plane or uterosacral ligaments were documented. Comparison of anatomical data of the two hemipelvis were conducted.

On cadavers and *in vivo* dissection, a right and left hypogastric nerves, covered by pre-hypogastric fascia, were identified in all specimens. Irrespective of the side, a wide anatomical variability was reported. Regarding differences between the two hemipelvis, we found that the right hypogastric nerve was further to the ureter and closer to the midsagittal plane than the left one. Mid-cervical plane was found 2.7 mm to the left of the midsagittal one. Right hypogastric nerve was found closer to mid-cervical plane and utero-sacral ligament than the left one.

An accurate knowledge of the pelvic retroperitoneal anatomy and differences between the two sides of the pelvis are essential to preserve hypogastric nerve during surgical dissection. Because of the wide anatomical variability, the use of an interfascial approach between fascia propria recti and pre-hypogastric fascia could help to perform an efficient nerve-sparing surgery.