Nerve-sparing radical hysterectomy—Muallem technique with explanation of parametrium and paracolpium anatomy

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Biography: Associate Professor Mustafa-Zelal Muallem is the deputy director of department of Gynecology with center for Gynecological oncology at the Charité medical university of Berlin, Germany. Associate Professor Mustafa-Zelal Muallem is also actively involved in training and supervising medical students, residents and fellows in gynecological oncology. His clinical research focuses on surgical therapy and developing innovative surgical approaches to treating gynecologic cancers and to maintaining the best quality of life after surgery by improvement of minimally invasive techniques, establishment of nerve-sparing procedure in oncological surgery and implement the reconstruction procedures after radical cancer operation.

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SUMMARY

Querleu et al.¹ restricted the term nerve sparing to radical hysterectomy type C, because the less radical types of hysterectomy (Type A and B) are not supposed to injure the pelvic autonomic nerve system. In Type C radical hysterectomy, which is indicated to stage IB1 with deep invasion of cervical stroma, IB2–IIA or early IIB according to the old version of the International Federation of Gynecology and Obstetrics classification of cervical cancers (FIGO 2009²), a total

resection of the vesicouterine (ventral parametrium) and vesicovaginal ligaments (ventral paracolpium) combined with a resection of adjusted length of the vaginal vault and its surrounding paracolpium is essential for sufficient removal of large and/or deep-infiltrating tumors.³ It is well known that the more extensive the vaginal and surrounding tissue ablation, the greater the resultant bladder denervation.^{4,5} This will be explained in that the radical resection (type C) sacrifices the ventral part of the inferior hypogastric

Video 1

Figure 1 The comprehensive anatomy of resected parametrium and paracolpium and the dissected pelvic autonomic nerve system: Parametrium marked with dotted blue line, paracolpium marked with dotted green line, ureter tunnel marked with dotted red line. ★ cut end of vaginal vessels, X cut end of uterine vessels. IHP, inferior hypogastric plexus; PSN, pelvic splanchnic nerves.

plexus, the bladder branches, and probably the pelvic splanchnic nerves (leading to type C2) without prior direct visualization and dissection of the bladder branches and inferior hypogastric plexus.⁶ This gives rise to two problems:

First, the current understanding of radical hysterectomy is more centered on the uterus, especially the uterine cervix and little or nothing being discussed concerning the significance of the resection of the vaginal cuff (that generally runs up to one-third or half of the vagina) and the paracolpium as an essential part of radical hysterectomy.^{1,7,8} (Figure 1)

Second, there is an obvious disparity of opinion concerning the technique of nerve-sparing radical hysterectomy despite agreement on the need to highlight all the anatomical autonomic nerve structures and sparing these nerves also.⁶

In our experience, understanding the precise three-dimensional anatomy of paracolpium and its close anatomical relationship to the components of the pelvic autonomic nervous system is the key in performing the nerve-sparing radical hysterectomy. Therefore, our technique concentrates on describing the entire three-dimensional anatomy of paracolpium and the essential role of vaginal vessels in the anatomy of radical hysterectomy. It incorporates also illustrating all parts of the pelvic autonomic nervous system and transecting only the uterine branches in order to preserve the hypogastric nerves, the pelvic splanchnic nerves, and the bladder branches of the inferior hypogastric plexus.

Recently, we published the results of the Muallem technique for nerve-sparing radical hysterectomy performed on 42 consecutive cervical cancer patients.³ Two-thirds of the patients had locally advanced tumors ($T > 40$ mm or $pT \geq IIA2$) with a median tumor size of 44.1 mm. The nerve-sparing radical hysterectomy approach, which depends on the comprehensive understanding of the precise entire anatomy of paracolpium (Muallem technique), was found to be feasible and applicable, even in locally advanced tumors, with good functional results (complete recovery of urological functions in 97% of patients 2 weeks after surgery) and encouraging short-term oncologic outcomes.³ (Video 1)

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