

## Nerve-sparing radical hysterectomy and the legacy of Japanese school

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*I love to hear to the ray,  
although let me stunned  
I like to run in the rain  
if the wind carries thunder.  
Eagle on the burning,  
the bull challenge.*

*The Legend of Florentino and the Devil. Alberto Arvelo Torrealba, 1940.*



The concept of radicalism has been reshaping first in the rationalization of surgical procedures. For example, in endometrial cancer limited to corpus uterine , and early vulvar cancer routine lymphadenectomy is unnecessary in about 85% of cases. Thanks to the sentinel node biopsy today it is possible to indicate such intervention only in necessary cases. In the same way is has been rethinking radical surgery in the extent of resection of the primary tumor in many pathologies. Clear resection margins have been modified and constantly refined the criteria for having surgery enough but keeping much of the functionality in risk and decreasing post-operative sequelae.

In the case of the radical hysterectomy devised in the late nineteenth century by European surgeons as Freund, Ries, Wertheim and Schauta, among others, it was reformulated by the contributions of Joe Vincent Meigs between the decades 1930-1940. This American surgeon, after an intense journey to witness the work of Bonney in London, Wanekros in Germany and Adler in Austria, began his extensive experience in the Pondville Hospital of Norfolk, Massachusetts. In 1944 he published a series of 100 patients with cervical cancer stage I and II, without perioperative mortality and a 5-year survival of more than 80% for stages I and 62% for stages II. This intervention, commonly known in the Western world as Radical hysterectomy of Wertheim-Meigs, is deeply rooted in the most prestigious schools of Gynecology at world and would remain until the beginning of the 1990s invariably in its technique and indications<sup>1</sup>.

At the same time, in Kyoto, former imperial capital of Japan, Hidekazu Okabayashi published in 1921 a modification of radical hysterectomy specifically in the

management of the parametrium. While the solid Western proposal consisted of a block of this anatomical structure resection, Okabayashi achieved a technique considered much more radical but with a carefully ligature and section of the parametrium. Is for this reason that in many texts of Gynecology, prior to the introduction of the new nomenclature for the classification of hysterectomies, was deservedly recognized his work under the name of Radical hysterectomy of Wertheim-Meigs-Okabayashi.

It is indisputable that Okabayashi contributions, have shaped the anatomical basis for the hard work made by the Japanese school, on nerve preservation in radical pelvic surgery, from almost a century ago. In 2008, Shingo Fujii, Professor of Kyoto University, and, as he defines himself, descendant of Okabayashi, in one of his most important publications described as anatomical and functional knowledge which resulted in a concrete proposal in this field was constructed<sup>2</sup>. In 1961 Kobayashi, at Tokyo University, describes the bladder functional changes in the postoperative period and the importance of the preservation of the pelvic splanchnic nerve. In 1983 Fujiwara and in 1992 Sakamoto focus on the preservation of the vesical branch of the inferior hypogastric plexus. This effort was joined by numerous studies on cadavers done in Japanese universities, as well as in Western countries. For Fujii et al, in 2007, was still not clarified the precise anatomy of this nerve plexus and write about this aspect the following<sup>2</sup>:

*Through this literature, we can learn the concept of how to preserve the pelvic nerves. However, the literature lacks critical photos and/or illustrations that are necessary for us to understand the precise anatomy needed for the preservation of the bladder branch from the inferior hypogastric plexus.*

In 2008 an original video of an intervention made by Okabayashi in 1932, was discovered and published in the International Journal of Gynecologic Cancer, along with two videos made by Fujii<sup>3</sup>. This publication became a reference and one of the pillars in this nascent sparing trend. Months later, in an article titled *Anatomic identification of nerve-sparing radical hysterectomy: A step-by-step procedure* and through the use of superb illustrations of his authorship, Fujii makes a bright and didactic description of the central pelvis nerve anatomy and methodically shows how to preserve it<sup>4</sup>. In October 2010, in the *Biennial Meeting of the International Gynecologic Cancer Society* held in Prague, Fujii presented his lecture *Surgical Anatomy of the Inferior Hypogastric Plexus*, in which he showed his proposal. Around of 300 attendees enjoyed an exhibition of the detailed technique, also supported by videos and drawings. His approach, focused on the identification and preservation of the autonomic innervation of the central pelvis, through the methodical dissection of the deep uterine vein, replaces clamping in mass of the vesicouterine ligament (VUL) by its segmental excision. Similarly proposes the display and conservation of the vesical branch of the inferior hypogastric plexus, ligand and sectioning individually inferior vesical vein. With independent dissection of the posterior leaf of the VUL it is achieved isolate the uterine plexus branch and section it individually, without sacrificing other branches. In cephalic sense, the identification and preservation of the inferior hypogastric nerves, at the base of the uterosacral ligaments also constitutes a fundamental part of his proposal.

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Thus we can see that thanks these contributions in surgical anatomy, preservation of pelvic autonomous innervation is today an essential part of the Gynecologic, Urological and lower digestive tract pelvic surgery. To this is added, as an advantage, clear display and ability of instrumentation of these thin nerve structures during laparoscopic either robotic radical surgery. The growing number and dissemination of videos in excellent quality, obtained during the robotics surgery, is currently one of the best models of teaching in anatomy and surgical techniques. In the service of Gynecology Oncology of the Instituto of Oncología Luis Razetti of Caracas since late 2008 has been adopted this technique in open surgery, following the precise guidelines of Fujii et al, achieving decrease in overt form, as in many parts of the world, the incidence of bladder and sexual dysfunction after radical surgery.

In 1944, a year before Japan will be destroyed after the end of the II World War, Hidekazu Okabayashi predicted in an article in Japanese<sup>5</sup>, cited and translated by Fujii, that the preservation of the pelvic nerve function would be one of the challenges in the future optimization of the technique of radical surgery, and he made no mistake.

### References

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