

## Failure of intraoperative sentinel lymph node staining during laparoscopic ilio-obturator lymphadenectomy in patients with prostate cancer

Piotr J. Marczyński<sup>1</sup>, Beata Paluchowska<sup>1</sup>, Paweł Wiechno<sup>1</sup>, Włodzimierz Ruka<sup>2</sup>

*Objectives.* To evaluate the effectiveness of intraoperative Patentblau V dye injection to the prostate in the identification of a sentinel obturator lymph node.

*Material and methods.* Between 1998 and 2000, the authors were attempting to stain sentinel lymph nodes in 17 patients with prostate cancer. The patients were qualified for laparoscopic ilio-obturator lymphadenectomy, preceding radical teloradiotherapy. Patentblau V dye was given to the prostate before the onset of surgery. The effect of staining was assessed during the operation. *Results.* No successful identification of the sentinel lymph node was observed. As a result, we abandoned further attempts of sentinel lymph node staining.

*Conclusions.* Intraoperative injection of Patentblau V into the prostate gland is ineffective for the staining of sentinel lymph nodes.

### Niepowodzenie śródoperacyjnego wybarwienia warowniczego węzła chłonnego podczas laparoskopowej limfadenektomii biodrowo-zasłonowej u chorych na raka stercza

*Cel pracy.* Celem pracy jest ocena skuteczności wybarwienia regionalnych węzłów chłonnych w wyniku podania barwnika Patentblau V do gruczołu krokowego.

*Materiał i metody.* Od 1998 roku do 2000 roku autorzy podjęli próbę wybarwienia węzła wartowniczego u 17 chorych na raka gruczołu krokowego. Pacjenci ci byli kwalifikowani do laparoskopowej limfadenektomii biodrowo – zasłonowej przed teloradioterapią z pól zewnętrznych. Przed przystąpieniem do zabiegu podawano do gruczołu krokowego barwnik Patentblau V. Efekt wybarwienia się węzłów chłonnych oceniany był podczas zabiegu operacyjnego.

*Wyniki.* W żadnym przypadku nie stwierdzono wybarwienia się węzła wartowniczego. Z tego powodu autorzy zrezygnowali z dalszych prób wybarwiania węzłów chłonnych.

*Wnioski.* W przedstawianym materiale nie uzyskano wybarwienia węzłów chłonnych po śródoperacyjnym podaniu barwnika do gruczołu krokowego.

**Key words:** Carcinoma of the prostate, laparoscopic ilio-obturator lymphadenectomy, sentinel lymph node

**Słowa kluczowe:** Rak stercza, laparoskopowa limfadenektomia biodrowo-zasłonowa, węzeł wartowniczy

### Introduction

In the recent years many authors have reported the value of lymphography in oncological surgery. Methods of lymphoscintigraphy or intraoperative staining of regional lymph nodes were introduced to improve their identification. The theory of the sentinel lymph node was presented by Cabanas for penile cancer, while it was developed and practically applied by Morton for malignant melanoma.

Basing upon their reports selective lymphography, involving intraoperative administration of the dye to the primary organ, was performed to identify the sentinel lymph nodes for the organ. This method is used in the treatment of malignant melanoma, breast cancer and penile cancer [1-7].

Prostate cancer is a common malignancy in men [8]. Only in case when the tumor is confined to the prostate gland will the patient benefit from radical treatment [9]. Physical examination and imaging examinations allow to assess the local stage of the disease and to exclude distant metastases, but are not sensitive and specific enough to diagnose the state of regional lymph nodes [10-14]. For such assessment histological examination is indispensable [9, 10, 15].

<sup>1</sup> Department of Urological Oncological

<sup>2</sup> Department of Soft Tissue/Bone Sarcoma & Cutaneous Melanoma  
The Maria Skłodowska-Curie Memorial Cancer Center  
and Institute of Oncology, Warsaw, Poland

The following groups of lymph nodes are considered regional for the prostate gland: obturator, external iliac, internal iliac and lateral sacral [10, 15]. Four techniques may be used to dissect ilio-obturator lymph nodes: open lymphadenectomy, lymphadenectomy by mini-laparotomy and laparoscopic ilio-obturator lymphadenectomy from either the transperitoneal or the preperitoneal approach. Advantages of laparoscopy include: minor injury, low complication rate, short hospitalization and rapid convalescence [10, 16]. The authors consider laparoscopy optimal and applied it for collecting lymph nodes.

Because of extensive lymphatic drainage of the prostate, the identification of the sentinel lymph node, a representative for an entire group of lymph nodes, could be very useful in clinical practice. In such situations surgery could be more limited and more specific.

### Objectives

Evaluation of intraoperative Patentblau V dye injection to the prostate for identification of a sentinel obturator lymph node.

### Material

Between 29.07.1998 and 20.12.2000, laparoscopic ilio – obturator lymphadenectomy was performed in 67 patients with prostate cancer, initially qualified for radical teletherapy. Median age was 64 years (49-75). Clinical stage of the prostate tumor ranged from T2a to T3b, stage T2b was prevailing.

The first 17 patients received a Patentblau V injection to the prostate before the onset of surgery. In the following cases authors abandoned the dye injection.

### Method

The needle was inserted into prostate through the perineal region. The location of the needle was confirmed during digital rectal examination (DRE) and 1 ml of Patentblau V was injected into each lateral lobe. The dye was administered to 17 patients preceding the onset of the operation by 0 to 170 minutes. The results of Patentblau injection were assessed during surgery. Each patient received prophylactic ciprofloxacin, starting 1 hour before Patentblau V injection and continued for 2 days.

The authors assessed effectiveness of lymph nodes staining, estimating the percentage of stained lymph nodes. In 17 consecutive cases no successful staining was observed and the authors abandoned further attempts at staining. For estimating the upper limit of the method efficacy the authors assumed that the 18<sup>th</sup> attempt at lymph node staining would be successful.

### Results

No successful identification of sentinel lymph node was observed in the group of 17 consecutive patients. The estimated efficacy of the method, as assessed by the percentage of dyed lymph nodes, is 0. The estimated upper limit of the method efficacy is 5.5% (from 0 to 16%, 95% confidence interval).

Complications were observed in 14% of patients. One patient had obstructive ileus, requiring laparotomy,

which was assessed as major complication. Other complications were classified as minor. The complication rate and type were identical among the 17 patients receiving Patentblau V and the remaining patients. No direct complications of intraoperative lymphography were observed.

### Discussion

Attempts at sentinel lymph node identification by injection of dye to the tumor or its direct surrounding and staining of the lymphatic flow were performed in several types of cancer [8, 15-20]. In a number of centers sentinel lymph node identification and dissection is considered standard management in case of patients with malignant melanoma [17, 18]. In 1981 Luciani published negative results of radioimmunonucleid injection to the prostate for identification of lymphatic drainage [10]. The authors have found no study, in which dye was injected intraoperatively to the prostate.

In the analyzed group no successful identification of sentinel lymph node was observed in 17 consecutive patients and the authors abandoned further attempts at lymph node staining. Our hypothesis is that the failure is caused by an abundance of blood vessels and lymphatic vessels supplying a glandular organ. Positive results of sentinel lymph node identification published in medical literature reported injecting a dye or an isotope to the tumor or its direct surrounding in cases of malignant tumors of the skin or its appendages (malignant melanoma of the skin, squamous cell carcinoma of the penis, breast cancer) [8, 15-19].

Intraoperative lymph node staining has a documented value for melanoma patients and breast cancer patients. It allows for a more precise diagnosis and better treatment results. Intraoperative labeling of lymph nodes is, in fact, a procedure of growing importance [2, 3, 5, 6, 7].

There are two possibilities of lymph nodes marking: staining with a non-toxic color agent or with a radioactive isotope. Both methods can be combined for better results [7]. The authors chose lymph node labeling with a color agent because the procedure seemed to be more suitable for the identification of sentinel lymph nodes for the prostate gland.

### Conclusions

Intraoperative injection of Patentblau V into the prostate is not useful for the identification of sentinel lymph nodes in patients with prostate cancer.

**Piotr J. Marczyński M.D.**

Department of Urological Oncological  
The Maria Skłodowska-Curie Memorial Cancer Center  
and Institute of Oncology  
Roentgena 5  
02-781 Warsaw, Poland

## References

1. Cabanas RM. Anatomy and biopsy of sentinel lymph nodes. *Urol Clin North Am* 1992; 19: 267.
2. Morton DL. Introduction: Sentinel Lymphadenectomy for Patients With Clinical Stage I Melanoma. *J Surg Oncol* 1997; 66: 267- 269.
3. Nowecki Z. Biopsja węzła wartowniczego u chorych na czerniaki skóry. Praca na stopień doktora medycyny. Warszawa: Centrum Onkologii-Instytut; 1999.
4. Luciani L, Menichelli E, Fuochi C et al. Lymph node staging in prostatic carcinoma Lymphography, pedal and intraprostatic lymphoscintigraphy, transcutaneous fine- needle lymph node biopsy and pelvic "guided" lymphadenectomy. Considerations on a series of 20 cases (1 September 1978- 31 January 1980). *Minerva Med* 1981; 72: 789- 800.
5. Jaśkiewicz J, Piechocki J, Chmielewski R. Lymphatic mapping and intraoperative identification of the sentinel node in N0 breast cancer patients. *Eur J Surg Oncol* 1998, 3: 248.
6. Jaśkiewicz J, Piechocki J. Biopsja węzła wartownika w raku piersi. *Nowotwory* 2000; 50: supl. 2 61- 65.
7. McMasters KM, Tuttle TM, Carlson DJ et al. Sentinel lymph node biopsy for breast cancer: a suitable alternative to routine axillary dissection in multi – institutional practice when optimal technique is used. *J Clin Oncol* 2000; 13: 2560-2566.
8. Zatoński W, Tyczyński J. *Epidemiologia nowotworów złośliwych w Polsce w piętnastolecie 1980-1994*. Warszawa: Centrum Onkologii-Instytut; 1997.
9. Doublet JD, Gattegno B, Thibault P. Laparoscopic pelvic lymph node dissection for staging of prostatic cancer. *Eur Urol* 1994; 25: 194-198.
10. Gill IS, Wood DP. Pelvic lymph node dissection for prostate cancer. *Atlas of the Urologic Clinics* 1995;1: 27- 42.
11. Hanks GE et al. Comparison of pathologic and clinical evaluation of lymph nodes in prostate cancer: Implications of RTOG data for patient management and trial design and stratification. *Int J Radiat Oncol Biol Phys* 1992; 23: 293- 298.
12. Hricak H. Noninvasive imaging for staging of prostate cancer: Magnetic Resonance Imaging, Computed Tomography and Ultrasound. *NCI Monogr* 1988; 7: 31-36.
13. Rifkin MD et al. Comparison of magnetic resonance imaging and ultrasonography in staging early prostate cancer. *N Engl J Med* 1990; 323: 621- 626.
14. Mazeman E et al. Place of the computed tomography in the staging of prostatic cancer. In: Murphy G, Khoury S (eds). *Prostate Cancer, part B: Imaging technique, Radiotherapy, Chemotherapy and management issues*. New York: Allan Liss; 1988; 55- 64.
15. Albala DM, Galal HA, Gomella LA. Laparoscopic pelvic lymph node dissection for prostate cancer. *Atlas of the Urologic Clinics* 1995; 1; 43- 50.
16. Gomella LG, Kozminski M, Winfield HN. *Laparoscopic Urologic Surgery*. Raven Press Ltd.; 1994, 111-129.
17. Paterson RO. *Urologic pathology*. London: J.B. Lippincott; 1986, 618.
18. McNeal JE, Kindrachuk RA, Freiha FS et al. Patterns of progression in prostate cancer. *Lancet* 1986; 11: 60- 63.
19. Wang MC, Papsidero LD, Kuriyama M. Prostatic antigen: a new potential marker for prostatic cancer. *Prostate* 1981; 2: 89- 96.
20. Partin AW, Yoo J, Carter H.B et al. The use of prostate specific antigen, clinical stage and Gleason score to predict pathological stage in men with localized prostate cancer. *J Urol* 1993; 150: 110-114.

Paper received: 27 February 2001

Accepted: 25 April 2001