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**Holmium: Yag laser vaporization of low grade papillary carcinoma of bladder during pregnancy: a case report**

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**ABSTRACT**

Low grade superficial papillary carcinoma is a rare neoplasia during pregnancy. Here, we report the case of a pregnant woman with a low grade papillary carcinoma of bladder treated with Holmium laser vaporization. Urologic follow-up included monthly both urinary cytology and ultrasound evaluation of bladder, and failed to detect either cellular atypia or further bladder anomalies. The course of pregnancy was uneventful subsequently. Our case suggests that Holmium laser vaporization is a safe and effective procedure during pregnancy.

**SOMMARIO**

Il carcinoma papillare superficiale di basso grado è una neoplasia rara durante la gravidanza. Qui, riportiamo il caso di una donna incinta con carcinoma papillare a basso grado della vescica trattato con vaporizzazione laser ad olmio. Il follow-up urologico includeva mensilmente sia la citologia urinaria che la valutazione ecografica della vescica e non ha rilevato né atipie cellulari né ulteriori anomalie della vescica. Il successivo corso della gravidanza è stato regolare. Il nostro caso suggerisce che la vaporizzazione con laser ad olmio è una procedura sicura ed efficace durante la gravidanza.

**Keywords:** bladder cancer; pregnancy; laser therapy.

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## INTRODUCTION

Malignant tumors are rare in pregnancy and the overall incidence is 2.35/10000 deliveries<sup>(1)</sup>. Urological malignancies and bladder cancers, in particular, are not among the most common kind of cancer in pregnancy<sup>(2)</sup>. This is confirmed by the fact that few cases are reported in the literature. Although bladder cancer is very uncommon in pregnancy, it may cause problems in diagnosis and treatment. Urinary tract symptoms mostly, related to this kind of tumor, are often mistakenly attributed to the effects of pregnancy<sup>(3)</sup>. Another problem related to bladder cancer and, in general, with malignant tumors during pregnancy is related with the management: it is often necessary to treat the lesion as soon as possible, to prevent the progression of the disease, but at the same time without affecting the physiological evolution of pregnancy. For this reason, it is important to define the safest and most efficient technique to treat cancer during pregnancy. Here, we report the case of a pregnant woman with a low grade papillary bladder carcinoma treated with a conservative technique.

## CASE REPORT

A 29 year old woman, para 0, came to us for obstetric care in May 2007, at 7 weeks' gestation, because of metrorrhagia and pelvic pain due to threatened abortion.

Pregnancy was ultrasonographically in agreement with gestational age; however, an incidental ultrasound finding was the presence of two echogenic lesions within the maternal bladder (**Figure 1**). The patient had no urinary specific symptoms, such as dysuria, haematuria or pollakiuria, previously.

After three days, the obstetric symptoms ceased and the woman was discharged under tocolytic therapy (hyoscine butyl bromide 20 mg/day) and folic acid supplement, and referred to urologic investigation. Following urinary test, which gave normal results, cystoscopy evidenced two papillary lesions of the bladder neck. Then, urologic counselling gave indication to surgery within eight weeks, in order to prevent progression in stage of the disease and poor outcome.

Thus, at 14 weeks' gestation (July 2007), after informed consent was obtained, the patient underwent transurethral vaporization of bladder (TUVB) under spinal anaesthesia and antibiotic prophylaxis with intravenous ceftriaxone 2 g. After washing the external genitalia, a rigid video cystoscope was inserted into the patient's urethra.

The bladder was re-examined, and the number, size and location of papillary lesions noted. Following cold blade biopsy, the lesions were excised through holmium laser treatment. Adequate vaporization of the papilloma resulted in total disappearance of the vaporized tissue. Biopsies were repeated after vaporization on the site of treatment. A catheterization was required for 24 hours.

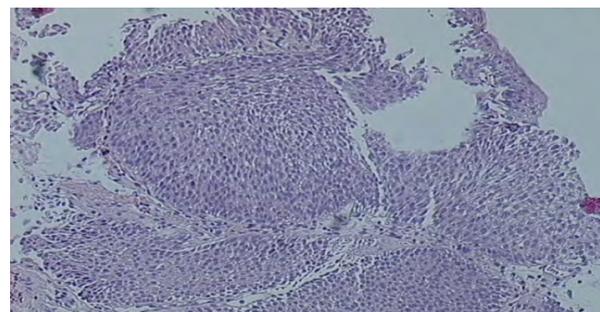
After surgery, the patient was given tocolytic therapy (hyoscine butyl bromide 30 mg/day) to prevent uterine contractility. Neither urinary bleeding nor infections were observed during the whole hospital stay as well as subsequently. She was discharged on postoperative day 3, after a good course. Non-infiltrating low grade (PTA G1) papillary carcinoma was diagnosed at definitive histopathology (**Figure 2**); post-treatment biopsy evidenced no persistence of lesions. Subsequently, the woman underwent obstetric and urologic follow-up at our Hospital as an outpatient.

Urologic follow-up included monthly both urinary cytology and ultrasound evaluation of bladder, and failed to detect either cellular atypia or further bladder anomalies.

Because of uterine contractility, the patient continued the tocolytic therapy (hyoscine butyl bromide 20 mg/day, earlier, and isoxsuprine



**Figure 1.**  
*Sonographic appearance of papillary carcinoma of bladder.*



**Figure 2.**  
*Histopathological features of the vesical neoplasm: Non-infiltrating low grade (PTA G1) papillary carcinoma.*

60 mg/day, later) and to take rest throughout the 2<sup>nd</sup> trimester of pregnancy. The course of her pregnancy was uneventful subsequently. Maternal blood pressure and clinical condition kept normal. A part from mild anaemia, for which the patient was given iron during the third trimester, maternal laboratory tests were normal. Foetal morphological anomalies were excluded, while foetal growth at the upper end of the normal range expected for gestational age was estimated at serial ultrasound control. After an uneventful labour, a male baby weighing 3760 g, with Apgar scores of 10/10, was delivered vaginally at 41 weeks' gestation (January 2008). No abnormalities were observed at cystoscopy performed postpartum. The woman breastfed her infant during six months.

Since January 2008, the patient is under urologic follow-up, including urinary cytology and bladder ultrasound every three months and cystoscopy every six months during the first five years; ultrasound every six months and cystoscopy every year subsequently.

The woman had a further uneventful pregnancy, subsequently: a male baby weighing 3550 g, with Apgar scores of 9/10, was delivered vaginally at term of pregnancy, in July 2011.

More than ten year follow-up confirmed no recurrences.

## DISCUSSION

Pregnancy is a critical period for both woman and baby as various complications related to different pathologies can occur<sup>(4-9)</sup>.

In this regard, oncological diseases represents a challenge in gynecology and obstetrics<sup>(10-19)</sup> with a significant impact on quality of life and psychological well-being<sup>(20-22)</sup>, especially if they compromise the ability to procreate<sup>(23-25)</sup> or, on the contrary, occur during pregnancy<sup>(26-30)</sup>.

Low grade superficial papillary carcinoma is a rare neoplasia during pregnancy<sup>(2,31)</sup>. 80 % of bladder tumours present as "superficial", but this term should not be mistaken for something totally without risk<sup>(3-32)</sup>. Recurrence of this tumor is reported in 50% to 75% of cases. Whereas the progression towards an invasive stage and poor outcome is reported in 5% of cases<sup>(33)</sup>.

Upon the initial diagnosis of a non invasive Ta, low grade, well differentiated tumor, surveillance with no further treatment after transurethral resection has long been standard. Follow-up with cystoscopies is important; if no tumour recurrence is seen after one year, follow-up may be lengthened. However, recently, an expectant management

without resection of tumour has also been proposed in these patients<sup>(33,34)</sup>. A holmium:YAG laser (Sphinx Holmium Yag Laser System, OHG 37191, Katlenburg- Lindau, Germany) was used in our case with a standard setting of 45 W, a repetition rate of 12 Hz, duration of 800 ns, with multiple pulses through a single fibre of 0.2-0.4 mm in a rigid cystoscope. During the procedure the red aiming spot of the distal tip of the laser fibre was held a few millimetres from or, when necessary, in contact with the tumour, whenever the laser was activated. The base of the tumour was also treated.

Holmium laser vaporization has been proposed as highly feasible in treatment of these neoplasms, since it is a simple surgical technique which, for the high incidence of recurrence of the disease, may be repeated<sup>(35)</sup>.

In our case, diagnosis of "superficial" carcinoma was posed at 7 weeks of the first gestation of the patient. Nevertheless, it was decided to delay surgery after the 12<sup>th</sup> week of gestation, due to both the condition of threatened abortion and the need of getting over the foetal organogenesis phase. Indeed, threatened abortion has complicated the course of the patient's first pregnancy during the first and second trimester. In any case, it was decided not to delay surgery further during pregnancy or after delivery, given the possibility of progression in stage of the disease.

Holmium laser was chosen to remove this tumour, since the procedure has the advantage to avoid electrical conduction or stimulation to the nearby tissues, which was crucial in our case for the anatomical position of bladder close to the pregnant uterus; moreover, electrical stimulation of surrounding tissues causes much of the discomfort that patients experience with electrocautery. Also, the procedure causes almost no bleeding and even patients on anticoagulant therapy can be treated.

Some authors assert that this technique does not permit to have an histological exam<sup>(35)</sup>. In order to obtain reliable histological staging of the tumour, we performed biopsies prior to vaporization. Biopsies were repeated on the site of treatment after vaporization, in order to verify that the excision was complete and that no lesions persisted.

The patient follow up with urinary cytology, bladder ultrasound and cystoscopy is still negative (more than ten year follow-up).

To our knowledge, this is the first case reported in the world literature of Holmium laser vaporization of a low grade non-infiltrating bladder carcinoma during pregnancy<sup>(36,37)</sup>. Our case suggests that this procedure is safe and effective.

## DECLARATION OF INTEREST

The authors report no declarations of interest. The authors alone are responsible for the content

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