

# Inguinal polypropylene plug: A cause of unusual testicular tumor pelvic metastasis

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## Summary

*We report the case of a patient who had undergone polypropylene plug placement 3 years before and referred to our institution with testicular tumor. CT scan demonstrated an enlargement of pelvic lymph nodes on the tumor side while retroperitoneal nodes were normal. Orchifuniclectomy was performed and histopathological examination showed a mixed germ cell tumor involving the tunica vaginalis, rete testis, epididymis and spermatic cord. After surgery the patient was addressed to adjuvant chemotherapy according to PEB scheme. Clinical re-staging showed a decrease of the pelvic bulk disease whereas retroperitoneal nodes were still normal and tumor markers were negative. Left external, internal and common iliac lymphadenectomy as well as left modified template nerve-sparing retroperitoneal lymph node dissection was performed. Intraoperatively the node bulk was firmly adherent to the external iliac artery and extended until the common iliac bifurcation. In the deeper part of this enlarged and firm lymphatic chain the polypropylene plug placed at the time of hernioplasty was found. Behind the plug all retroperitoneal nodes appeared normal and resulted negative on histopathologic examination. The patient had an unusual metastatization, probably due to the plug.*

**KEY WORDS:** Testicular tumor; Polypropylene plug; Metastasis.

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## INTRODUCTION

The lymphatic drainage of the testis follows the vessels around the spermatic vein until the retroperitoneal nodes between the lower thoracic and lumbar vertebrae. For this reason testicular cancer spreading usually involves the lymph nodes in the retroperitoneum as primary landing site. However, atypical lymphatic sites may be involved and a 2% incidence of inguinal metastases in testicular cancer has been reported (1-4). This atypical spreading has been related to history of previous surgery in the inguinal region or scrotum. A modified lymphatic drainage can be created by surgical violation during orchidopexy, relief of hydrocele or varicocele (5-10). In

these cases direct lymphatic drainage to the inguinal nodes can be developed.

We report a case of unusual lymphatic spreading of testicular cancer after previous hernioplasty in which a polypropylene plug was deeply placed into internal inguinal ring according to the the Lichtenstein tension-free mesh onlay repair (11).

## CASE REPORT

A 26 years old man was examined on March 2001 for left testicular mass which appeared as clinically malignant. He

had undergone Lichtenstein tension-free mesh onlay repair by a “plug” technique three years before. Alpha-fetoprotein (normal range 0-15 IU) and beta-hCG (normal range 0-5 IU) were both raised to 9.9 IU and 15 IU, respectively. CT scan showed bulk disease of pelvic lymph nodes on the left side while retroperitoneal nodes were normal (Figure 1). Orchifuniclectomy was performed and histopathological examination showed a mixed germ cell tumor involving the tunica vaginalis, rete testis, epididymis and spermatic cord. After surgery the tumor markers were still raised. The patient was addressed to adjuvant chemotherapy according to PEB scheme. Clinical re-staging showed a decrease of pelvic bulk disease, retroperitoneal nodes still normal and negative tumor markers. Left external, internal and common iliac lymphadenectomy as well as left modified template nerve-sparing retroperitoneal lymph node dissection was performed (Figure 2). Intraoperatively the node bulk was firmly adherent to external iliac artery and extended until the common iliac bifurcation. In the deeper part of this enlarged and firm lymphatic chain the polypropy-

**Figure 1.**

*CT scan showing bulk disease of pelvic lymph nodes on the left side.*



**Figure 2.**

*Retroperitoneal lymph node dissection.*



**Figure 3.**

*Polypropylene plug found in the deeper part of the enlarged and firm lymphatic chain.*



lene plug placed at the time of hernioplasty was found (Figure 3). Behind the plug all retroperitoneal nodes appeared normal and resulted negative on histopathologic examination. External iliac and obturator lymph nodes however showed large tissue necrosis and focal mature teratoma. After 3 years the patient underwent left inguinal lymphadenectomy for lymph nodes enlargement. Histopathologic examination showed no recurrent cancer. At the last follow-up the patient was healthy and free of disease, father of a child spontaneously conceived two years ago.

### DISCUSSION

Inguinal hernioplasty represents one of the most frequently performed surgical operations. The recent introduction of prosthetic mesh made Bassini operation obsolete, with more space gained by the newly developed “tension-free” and “sutureless” surgical technique (12, 13). The study proposed by Gandolfo showed the tissutal reaction consequent to the plug. At ultrasonography the mesh presented as a small hyperechoic layer. In some patients a seroma was present above the mesh. The seroma disappeared spontaneously between 30 and 90 days postoperatively and was probably related to the size of the hernia and the number of plugs (14).

Various studies analyzed the factors associated with postoperative complications and hernia recurrence (15).

In about 2% of cases testicular cancer lymphatic metastatization is atypical and includes inguinal lymph nodes (1-4). This unusual lymphatic spreading may happen for a significant variation of an otherwise normal anatomical pattern. It has been clearly reported in literature that in almost all cases of atypical lymphatic metastatization patients had previously undergone scrotal or inguinal surgery (orchidopexy, relief of hydrocele, trans-scrotal biopsy or varicocelectomy) (5-10). However, lymph-node metastases in the inguinal region can be found in patients with no previous surgery, mostly in patients with germ cell tumours, and these are probably due to infiltration from metastases of the spermatic cord (9, 16). In our case of atypical node metastatization, the lymphat-

ic spreading was very unusual since it only involved nodes in the pelvic area. This can be explained by the alteration of normal lymphatic drainage pattern in the spermatic cord during inguinal hernioplasty as well as during tissue healing in the post-operative period. The polypropylene plug deeply placed in the internal inguinal ring might have played a role in the alteration of the normal lymphatic circulation in the spermatic cord. The blockage of normal lymphatic up-flow probably caused a chronic extravasation and created new lymphatic communications with the pelvic nodes. As a consequence, the bulk pushed the plug deeper, up to the common iliac bifurcation. The absence of involved nodes above confirms the lymphatic barrier effect caused by the plug.

Another point of discussion is the left inguinal node enlargement that occurred three years later. As above mentioned, the inguinal node involvement in cases of previously scrotal or inguinal surgery or in cases of locally advanced disease is well known. For this reason the patient underwent inguinal lymphectomy, without evidence of disease.

The treatment of these rare cases is matter of debate. On one hand Mianne does not consider ipsilateral node dissection necessary, owing to the efficacy of primary or secondary chemotherapy in non seminomatous testicular tumors, while for testicular seminoma, he suggests additional inguinoscrotal radiotherapy (2). On the other hand Van Ahlen considers as therapy of choice the adjuvant chemotherapy and salvage lymphadenectomy in case of residual tumor, including peri-iliac lymphadenectomy (3).

## CONCLUSION

In the case reported we stress that a polypropylene plug located near iliac vessels could induce an important tissutal reaction and alter the lymphatic flow, with the consequent metastatic involvement of pelvic nodes preserving the common iliac and paraortic nodes.

In this case the massive local diffusion of the disease could allow a simple diagnosis, but nowadays in many cases the lymph nodes involvement is only microscopic, therefore not clinically evaluable.

On the other hand the use of propylene plug for hernioplasty is very frequent. We think that is mandatory to consider the opportunity of extending surgical or radiant approach to iliac and obturator region in patients suffering from testicular germ cell cancer if they had previously underwent hernioplasty with polypropylene plug.

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