CASE REPORT

UROLOGICAL ONCOLOGY

Unfavorable prognosis of nephroblastoma in adults

Joanna Huszno[1], Danuta Starzyczny–Słota[2], Magdalena Jaworska[3], Elżbieta Nowara[4]

[1]Maria Skłodowska–Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Poland
[2]Clinical and Experimental Oncology Department, Maria Skłodowska–Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Poland
[3]Tumor Pathology Department, Maria Skłodowska–Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Poland
[4]Clinical and Experimental Oncology Department, Maria Skłodowska–Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Poland

Article history
Submitted: Jun. 12, 2012
Accepted: Aug. 20, 2012

Correspondence
Joanna Huszno
Center and Institute of Oncology
15, Wybrzeże Armii Krajowej Street
44-101 Gliwice, Poland
phone: +48 660 726 068
joahus@wp.pl

Wilms' tumor is the most common type of malignant kidney tumor in children. Due to the fact that this type of cancer is so rare in adults, however, there is a significant lack of treatment strategies in this age group. Moreover, the treatment of adults is often based on protocols used in children. The present report describes a case of a 25–year–old male with nephroblastoma stage IV, who had a primary surgery and underwent chemotherapy with CDVC (cyclophosphamide, doxorubicin, vepesid, carboplatin). During the systemic treatment, the authors observed progression of disease and serious side effects.

Key Words: kidney cancer ‹› nephroblastoma in adults ‹› chemotherapy

INTRODUCTION

Wilms' tumor (nephroblastoma) is one of the most common malignant tumors of childhood. Occasional examples have been described in adults (about 3% of all described cases) [1, 2]. This fact has caused significant diagnostic and therapeutic difficulties in the adult age group. The first symptoms in adults include pain and hematuria, while children simply present with a painless abdominal mass that is detectable by palpation and rapidly increasing in size. Treatment protocols in children were developed by multicenter American and European expert groups named The National Wilms' Tumor Study Group (NWTS) in North America and the International Society of Pediatric Oncology (SIOP) and the Polish group called the Wilms' Tumor Team of the Polish Pediatric Solid Tumor Treatment Group (PPGGL) in Europe [3, 4]. In the NWTS study trials the treatment includes primary nephrectomy followed by chemo and/or radiotherapy [5]. In the SIOP study trials children older than six months of age are treated with preoperative chemotherapy followed by nephrectomy and further chemo– and/or radiotherapy. In adult Wilms' tumors, the modified pediatric protocols are used.
The purpose of this article is to describe a case of an adult patient diagnosed with nephroblastoma as well as treatment strategies concerning this disease unit.

CASE REPORT

A 25–year–old man was admitted to the surgery unit in Italy in January of 2008 due to severe right flank pain with occurrence of gross hematuria, urinary frequency, and urodynia. The results of an abdominal ultrasound revealed a hypo–echoic area measuring 6x10 cm in the right renal collecting system. A CT scan was not routinely performed. On physical examination and chest X–ray, metastases were not found. Laboratory investigations and urinalysis revealed no abnormalities. The patient underwent a right nephrectomy with simultaneous removal of right adrenal gland. Macroscopic evaluation of the specimen revealed a polycystic tumor 10 cm in diameter. The histopathological diagnosis was: nephroblastoma with microscopic evidence of renal pelvis and renal sinus vessels neoplastic infiltration without crossing the renal capsule. The stage of disease was assessed as stage I according to the SIOP staging system. An adjuvant treatment was not performed after nephrectomy. The follow–up was conducted in the surgery center. In September 2008

(eight months after the surgery) computed tomography scanning revealed a lymph node enlargement measuring 2.5 cm in the area of the lower vena cava. The patient was subsequently admitted to the Maria Skłodowska–Curie Memorial Cancer Center, Gliwice Branch. He was in a good physical condition, but complained of fatigue and pain in the lumbar spine area. In a CT scan of the chest, the presence of two metastases was determined. One measuring 2.8 x 3.8 cm located above the diaphragm in the VIII segment of the right lung and the other one measuring 1.5 cm in diameter within the III segment of the left lung (Fig. 4, Fig. 4b). Several metastases ware observed also in chest X–ray in both lungs – a greatest at the base of the right lung (diameter 5.5 cm) (Fig. 5).
Consultation of histological slides was performed. The tumor was composed mostly of diffuse sheets

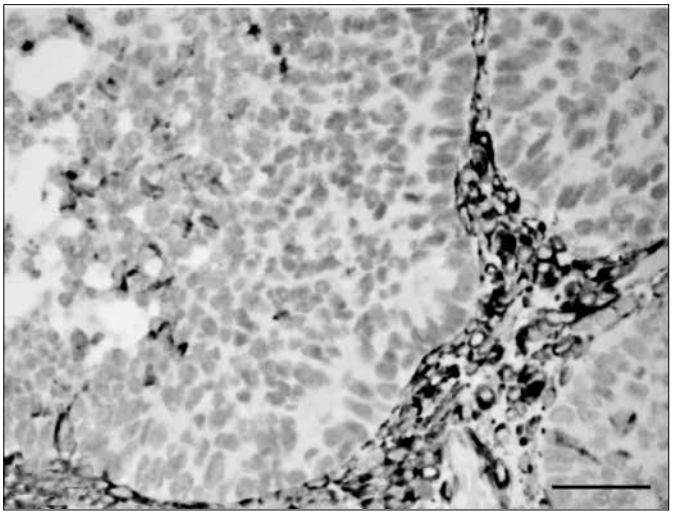


Figure 3. *Weak nuclear expression of WT1 in blastemal cells. Original magnification, 400x.*

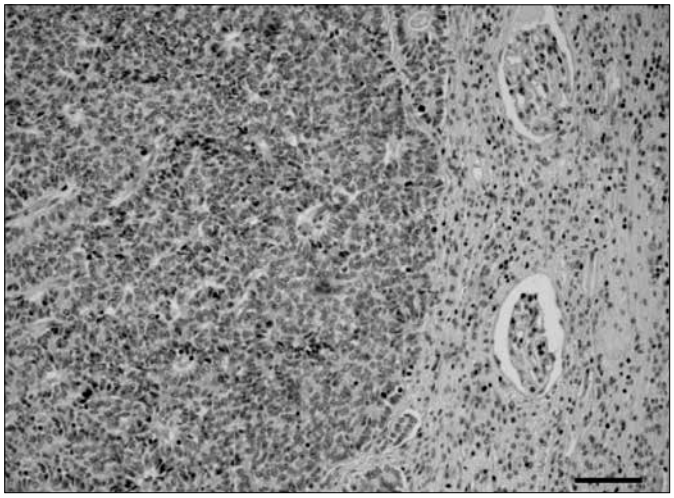


Figure 1. *Nephroblastoma–renal tissue interface. Blastemal cells in diffuse sheets and cord–like pattern. H&E original magnification, 100x.*

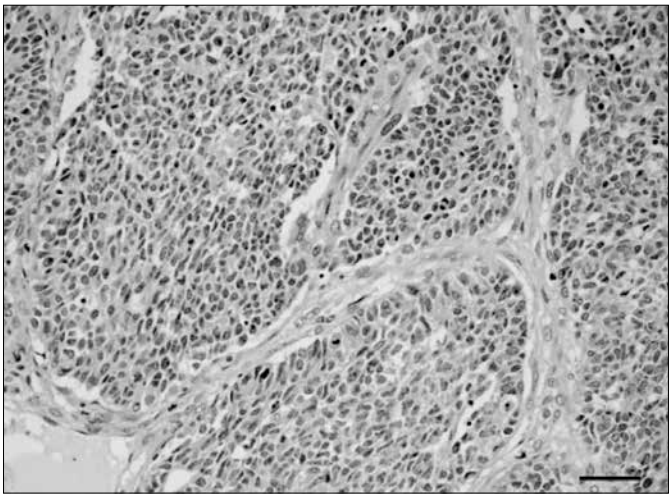
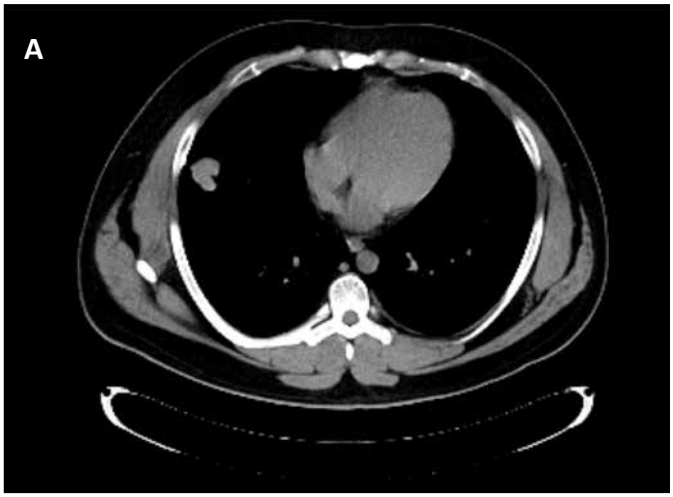
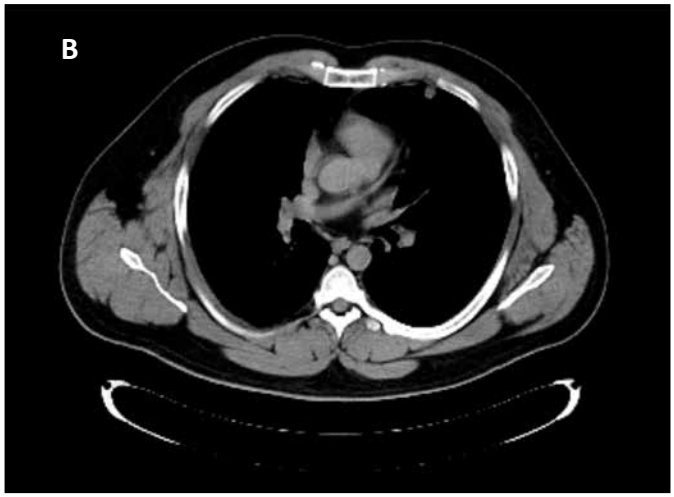


Figure 2. *Blastemal component in nephroblastoma. Mitoses and apoptotic bodies. H&E original magnification, 300x.*

of blastemal cells with irregular nuclei, numerous mitotic figures, and apoptotic bodies. Focally, there was a cord–like growth pattern and the stromal component was scared. Areas of necrosis were also seen (Figs. 1 & 2). Immunohistochemically, blastemal cells expressed WT1 and were CD 99 negative (Fig. 3). The final diagnosis was: nephroblastoma – blastemal type. The presence of vassal infiltration in the renal sinus (described in the first diagnosis) suggested stage II. The current stage of disease was assessed as stage IV according to the SIOP staging system.
In December 2008, the patient began receiving chemotherapy based on the CDVC scheme. He was given 450 mg/m^2 of cyclophosphamide during days 1–3, 50 mg/m^2 of doxorubicin on day 1, 120 mg/m^2 of vepesid on days 15–17, and 150 mg/m^2 of carboplatin on days 15–17, in 28 days intervals. The treatment was continued for 34 weeks. Before each cycle the patient's condition was assessed according to the ZUBROD scale, physical examinations were done, and laboratory tests were conducted. Neutropenia stage IV according to Common Toxicity Criteria (CTC) occurred after the first cycle of chemotherapy. Although the doses of cytostatics were reduced and prophylaxis of febrile neutropenia with granulocyte colony stimulating factors was applied, the patient experienced hematological complications after each cycle. Generally, he was given IV chemotherapy cycles. The control CT scan revealed disease progression in the form of new lymph node metastases in the mediastinum and in the hilum of the right lung (Fig. 6). Disease progression was also observed in chest X–ray (Fig. 7). The case was determined as chemo–resistant and chemotherapy treatment was terminated.
In July of 2009 a progression in the sizes of the metastases in both the lungs and the lymph nodes in





Figures 4A & 4B. *CT scan of the chest. The presence of two metastases: one located above the diaphragm in the VIII segment of the right lung and the other in diameter within the III segment of the left lung.*

the mediastinum and the abdominal cavity was observed. The metastasis in the retroperitoneal area gave rise to compression symptoms, pains in the right lumbar spine area, coughing, physical weakness, and swelling of the left testicle. The patient had surgical consultation in order to determine the possibility of surgical treatment of the tumor in the retroperitoneal area what turned out to be impossible. Therefore, palliative radiotherapy was given. Photons with beam energy of 20 MV were used in the area of the retroperitoneal lymph nodes in a fractional dose of 3 Gy to a total dose of 30 Gy per tumor. The clinical and imaging control examination revealed progression of the disease. The patient's physical condition worsened and pains in the lumbar spine area became more severe. The patient died in February of 2010, 13 months after the Wilms' tumor diagnosis.

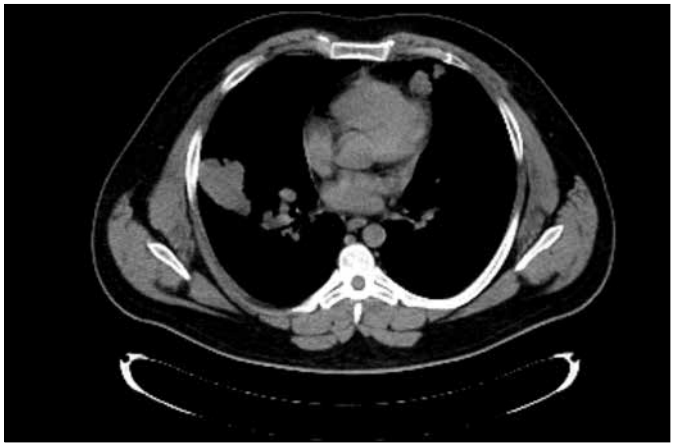


Figure 6. *Control CT scan of the chest. Disease progression in the form of new lymph node metastases in the mediastinum and in the hilum of the right lung.*

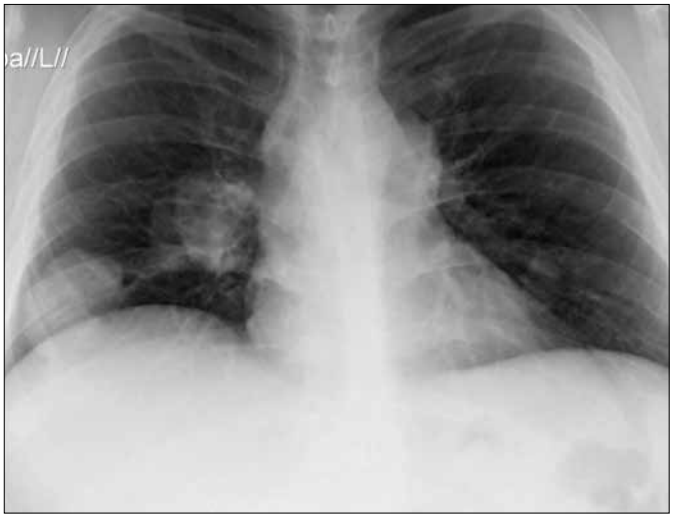


Figure 5. *Chest X–ray. Several metastases in both lungs – greatest at the base of the right lung of diameter 5.5 cm.*

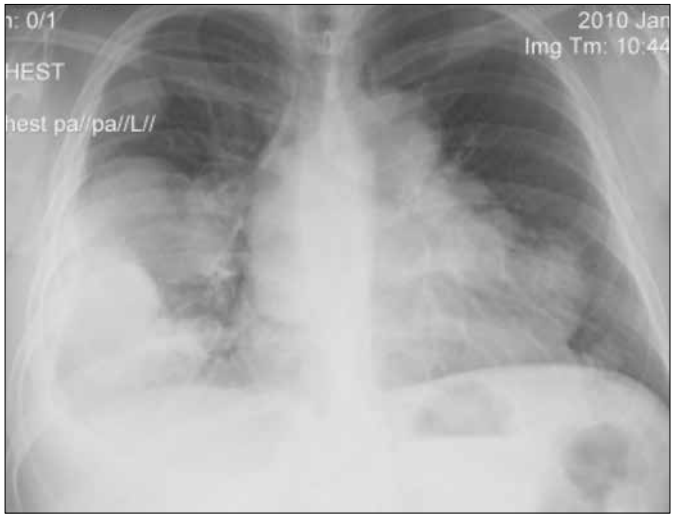


Figure 7. *Control chest X–ray. Increase in size and number of metastases in both lungs. Disease progression.*

CONCLUSIONS

Nephroblastoma (Wilms' tumor) in adults is most commonly diagnosed in stage IV therefore the prognosis in this group of patients remains less favorable. The prognosis depends on the primary advancement stage, the histological structure, time since the first remission, type of therapy used, and the recurrence location. Due to the fact that nephroblastoma is a very rare type of cancer there are no standard therapy in adult patients. They should be treated in an individual way based on the available schemes used in children. Treatment toxicity in adults is higher than in children. High risk of hematological and non–hematological severe side effects can lead to dose reduction with respect to the recommended doses in pediatric protocols. Using therapy schemes based on pediatric protocols leads to similar results as seen in children. Pathological diagnosis, especially immunohistochemical staining, is very important to differentiate nephroblastoma from other tumors.

ACKNOWLEDGEMENT

The authors thanks the Radiodiagnostics Department in Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology in Gliwice for providing X-rays and CT scans.

References

1. Patil TV, Patel KM, Shukla SN, Parikh BJ, Anand AS, Shah MS. Adult Wilms' Tumor. Case Report. Indian J Med Pediatr Oncol. 2008; 4: 37–40.
2. Kattan J, Tournade MF, Culinde S, Terrier–Lacombe MJ, Droz JP. Adult Wilms' tumor: review of 22 cases. Eur J Cancer. 1994; 30: 1778–1782.
3. de Kraker J (edit.). Nephroblastoma Trial & Study SIOP Protocol. December 2001, Amsterdam.
4. Reinhard H, Aliani S, Ruebe Ch, Stöckle M, Leuschner I, Graf N. Wilms' Tumor in Adults: Results of the society of pediatric oncology (SIOP) 93–01/ Society for pediatric oncology and hematology (GPOH) study. J Clin Oncol. 2004; 22: 4500–4506.
5. Grundy P, Breslow N, Green DM, Sharples K, Evans A, D'Angio GJ. Prognostic factor for children with recurrent Wilms' tumor: results from the Second and Third National Wilms' Tumor Study. J Clin Oncol. 1989; 7: 638–647.