

SACROCCYGEAL TERATOMA SURGICAL TREATMENT - A FIVE YEARS EXPERIENCE

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Abstract

Introduction Sacrococcygeal teratoma represent the most common neonatal neoplasm. Females are more 4 times more likely to present this type of tumor. Altman's classification divides sacrococcygeal teratoma into 4 types. Alpha-fetoprotein is the most common biological marker for evaluating SCT's malignancy and follow up. Tumor removal together with the coccyx is the standard surgical procedure for SCT treatment.

Aim The aim of this study is presenting our experience with SCT between 2005 and 2009.

Materials and Methods Fourteen consecutive cases treated by our surgical team in 5 years are presented in this analysis. Age at presentation and age at surgery, Altman's classification, alpha-fetoprotein levels and surgical procedure and 1 year follow-up events were parameters used in our retrospective study.

Results Mean age at presentation was 12 months. According to Altman's classification we treated 6 cases of type I, 4 cases of type II, 1 case of type III and 3 cases of type IV. In 4 cases delay of the diagnosis and treatment led to malignant transformation and subsequent chemotherapy. Among these local recurrence was noted after the oncologic treatment, these two being evaluated for further therapy.

Conclusion Early diagnosis and treatment and careful postoperative follow-up are mandatory for good results in SCT treatment.

Key words: sacrococcygeal teratoma, Altman classification, neonatal tumor

Introduction

Sacrococcygeal teratoma (SCT) is the most common neoplasm in the neonatal period having an incidence of 1 to 40,000 births. Its malignancy depends on the age, increasing from 10% in neonatal period to almost 70% in the second month of life. Females are 4 times more frequently affected than males [1].

Most of the SCT are present at birth as a sacral mass, but some of them – the total intrapelvic ones - can be discovered late after as a misleading presentation of urinary or intestinal obstruction [2]. In the last years, antenatal diagnosis was achieved in more than 50% of the pediatric population, because of the evolution of imagistics [3].

In 1974, Altman, et al. [4] divided the SCT, depending on the tumor localization, in 4 types: I (tumors with a predominant external component – sacrococcygeal and a minimum presacral part), II (tumors which present externally but having a large intrapelvic extension also), III

(tumors who appear to be external but the dominant mass was pelvic with intraabdominal extension) and IV (tumors presenting completely presacral with no external development. Recent studies showed no link between Altman's subtypes of SCT, their structure (cystic/solid) and the malignant potential of the tumor. [1] However, Altman's classification remains the most known descriptive classification of teratomas.

AFP levels is the most common SCT marker. Its elevated levels can also bring useful hints about tumor recurrence or malignant degeneration. In infants AFP levels are normally elevated in the first 8 months of life while the mean time required for AFP to normalize after SCT resection is about 9 months. Early excision of SCT together with the coccyx is the surgical procedure of choice for this malignancy. [5]

Aim

Our aim is to determine which aspects in treating SCT could bring favorable results and prevent recurrences of the malignancy.

Materials and methods

We studied the 14 cases of SCT treated by a single surgical team between 2005 and 2009 (Table 1). Age at presentation and age at surgery were parameters included in this retrospective study. Gender was also noted. All patients were classified according to Altman's algorithm. Alphafetoprotein (AFP) levels were analyzed before and after surgery at 1 week, 1 month, 6 months and 1 year. Surgical procedure performed, complementary oncologic treatment and recurrence at 1 year postoperative were also factors included in this report.

Results

The mean age of presentation was ~1 year and the median age was ~1 year and 7 months. Sex ratio was M:F 4:10. We performed the surgery in approximately 2 days from the admission.

According to Altman's classification 6 patients (~42%) were type I (Fig.1), 3 patients (~21%) were type II (Fig.2), 1 (~7%) was type III (Fig.3), 3 patients (~21%) were type IV (Fig.4). In Altman I type mean age at presentation was 1.8 days, while the mean age at presentation for the other types of SCT were: approximately 2 years and 2 months for Altman II and 1 year and 2 months for Altman IV.

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Figure 1. Clinical aspects in type I SCT.

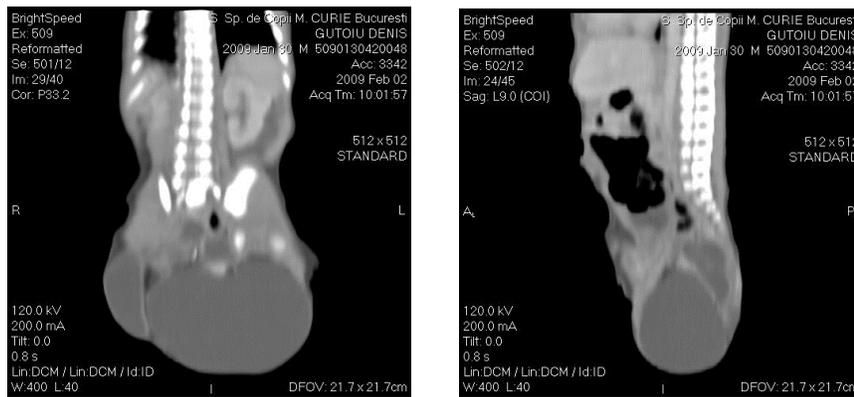


Figure 2. Computer tomography aspects of type II Altman SCT.



Figure 3. a. Removed specimen of Altman III SCT together with the coccyx (note the significant intrapelvic extension). b. Postoperative view after excision.

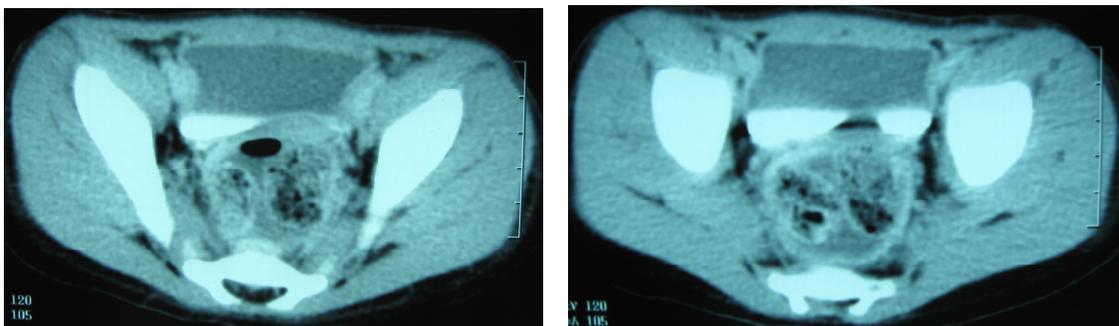


Figure 4. CT aspect of a type 4 SCT.

AFP was detected positive in 12 out of 14 cases at admission. In 3 cases AFP was still positive 6 months after surgery. These patients were operated and diagnosed in the first 5 days of life.

In all patients tumor removal together with the coccyx was performed.

In the neonates, all of the classified into Altman I type, days spent until surgery were about 2, while in the

others days passed for admission to surgery were approximately 5 (Table I).

Only 2 patients out of 14 presented 1 year recurrence after surgical treatment, one of them despite the chemotherapy performed. One of them was Altman III detected at more than 2 years old and the other one was Altman IV diagnosed at 1 year and 1 month.

None of the patients were included in Currarino triad syndrome or associated any anorectal malformations.

Table 1. Main aspects studied in SCT series.

	Age at presentation	Gender	Days till surgery (in hospital)	AFP detection: admission/6 months followup	Altman's classification	Chemotherapy	Recurrence 1 year
1	1 day	M	1	+/+	I	-	no
2	1 day	F	2	+/-	I	-	
3	1 day	F	2	+/+	I	-	
4	1 day	M	2	+/-	I	-	
5	2 days	F	3	-/-	I	-	
6	5 days	F	2	+/+	I	-	
7	1 year 10 months	M	5	+/-	II	-	
8	3 years 2 months	F	2	+/-	II	+	
9	2 years 1 month	M	6	+/-	II	-	
10	1 year 6 months	F	4	+/-	II	-	
11	2 years 2 months	F	5	+/-	III	+	yes
12	1 year 1 month	F	8	+/-	IV	+	yes
13	1 year 2 months	F	3	-/+	IV	-	no
14	1 year 4 months	F	4	+/-	IV	+	no

Discussions

Rectal digital examination is an extremely useful step in clinical assessment of a child with chronic constipation. This easy procedure can prevent malignancy by early diagnosing presacral tumors.

All our Altman I SCTs were diagnosed immediately after birth and operated as soon as possible. There were no malignant transformation in these and no further recurrences. 50% percent of the cases diagnosed after the age of 1 year presented malignant transformation requiring postoperative chemotherapy treatment. There were no perioperative deaths in our series. We had three cases of recurrences after tumor excision without coccyx removal in other units. We performed the right excision and follow up showed good results.

Coccyx removal is a mandatory surgical step in SCT excision in order to prevent recurrences. Thorough dissection is necessary to prevent postoperative continence disorder and rectal wall injuries. Median sacral artery must

be identified and carefully ligated. In the presence of an abdominal extension of the tumor, an abdominoperineal approach is needed as we encountered in one case.

The idea stated by Altman, et al. [4] about the link between the age and SCT's cancerous transformation is supported by more authors who recommend surgery as soon as possible after birth in order to prevent malignant transformation [6].

Conclusions

Early diagnosis and correct treatment is mandatory in order to prevent malignant transformation. A standardized follow-up protocol is recommended to early prevention of eventual recurrences. Multidisciplinary assessment of SCT – surgery, neonatology, oncology – brings excellent results in its treatment. We must emphasize that cases with no external appearance and abdomino-perineal involvement the rectal digital examination is an extremely useful tool.

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