CASE REPORT

A Rare Presentation of Infantile Virilization Secondary to Malignant Etiology

V. Dasarwar Nagesh¹ · D. Ramkrishnan Santosh¹ · N. Datla Sravya¹

Received: 2 March 2016 / Accepted: 9 November 2016 / Published online: 18 November 2016
© Indian Association of Surgical Oncology 2016

Abstract Adrenocortical tumor is a rare malignancy (1–2/ million) in children with a heterogenous presentation and generally poor prognosis. We report two cases of adrenocortical carcinoma who presented primarily with virilization along with cushingoid features and hypertension. Both children were managed with surgical resection of tumor, steroid replacement, and antihypertensives.

Keywords Virilization · Clitoromegaly · Cushing syndrome · Adrenocortical carcinoma

Introduction

Adrenocortical carcinoma is a rare but highly aggressive malignancy with an estimated annual incidence of 1.5 to 2 per million population [1]. Females are more commonly affected. There is bimodal age distribution with peaks occurring before age 5 years and a second peak in the fourth to fifth decade [2]. The prognosis is poor with a significant proportion (21 to

39%) of patients having distant metastasis at the time of presentation [2], and a 5-year and overall survival ranges between 38 and 60% [1]. Even after curative resection, the majority of patients develop early tumor recurrence or distant metastasis [1, 2].

Adrenocortical tumors may occur sporadically or as a component of certain hereditary syndromes and are sometimes associated with syndromes such as the Li-Fraumeni syndrome, Beckwith-Weidemann syndrome, multiple endocrine neoplasia-1, Carney complex, and congenital adrenal hyperplasia [9, 10].

Case Report

Case 1 An 8-month-old girl presented with excessive weight gain, predominantly in the truncal region and face, hirsutism, and pubic hair growth. On examination, cushingoid phenotype was observed with hirsutism, facial and pubic hair, clitoromegaly, and hypertension, BP 142/90 mmhg [normal for age—80/50] (Fig. 1a–c).

Biochemical evaluation showed normal plasma ACTH, serum cortisol 42.1 mcg/dl (normal 3.7–19.4 mcg/dl), testosterone 6.91 g/dl (normal 0.11–0.78 g/mg), DHEA-S 28.8 mmol/l (normal 0.01–0.53 mmol/l), and androsterdione >12.0 ng/ml (normal 0.50–4.8 ng/ml). Complete blood profile showed Hb 11.3 g% (normal 10–14 g%), TC 11400 cells/cumm, platelets 6.2 lakhs, and ESR 62 mm at the end of 1 h; serum electrolytes, calcium, and renal and liver functioning tests were within normal limits. CT abdomen with I.V contrast showed 5.1 cm*5.2 cm mass lesion of soft tissue density attenuation in the right suprarenal region showing mild contrast enhancement with no evidence of calcification or liver involvement, suggestive of adrenocortical carcinoma (Fig. 3).

Key Messages

1. Adrenocortical carcinoma presenting as cushingoid features in early infancy is extremely rare.
2. Early suspicion and appropriate management can be life saving.

✉ V. Dasarwar Nagesh
dsrwr@yahoo.co.in

D. Ramkrishnan Santosh
dr.rsantosh@gmail.com

N. Datla Sravya
sravya.datla516@gmail.com

¹ GMR Varalakshmi Care Hospital, Dist. Srikakulam, Rajam, Andhra Pradesh, India

Fig. 1 a–c Cushingoid habitus, buffalo hump, truncal obesity, moon facies, and pubic hair growth

Right adrenal tumor resection was performed and histopathological examination was reported as adrenocortical carcinoma with no extracapsular extension. Post surgery outcome was favorable with decreased cushingoid appearance and decreased clinical virilization (Fig. 2).

Blood pressure returned to normal. Testosterone, androstendione, and DHEA-S levels returned to normal. Over a period of the next 2–3 months, oral hydrocortisone and enalapril were tapered and stopped (Fig. 3).

Case 2 A 7-month-old female child presented with rapid weight gain and hirsutism. On detailed physical examination, she was having excessive pubic hair, clitoromegaly, hypertension [BP—148/88], and cushingoid features. Abdominal palpation showed lump in the left side of the abdomen. Biochemical evaluation showed normal plasma ACTH, serum cortisol 84.0mcg/dl (normal 3.7–19.4 mcg/dl), testosterone 9.4 g/dl (normal 0.11–0.78 g/mg), DHEA-S 42.8 mmol/l (normal 0.01–0.53 mmol/l), and androsterdione >17.0 ng/ml (normal 0.50–4.8 ng/ml). Complete blood profile showed Hb 9.3 g% (normal 10–14 g%), TC 9200 cells/cumm, platelets 4.2 lakhs, and ESR 40 mm at the end of 1 h; serum

electrolytes, calcium, renal, and liver functioning tests were within normal limits.

MRI abdomen showed heterogenous 7.7*6.4 cm, mass in the left suprarenal region suggestive of adrenal adenocarcinoma (Fig. 4).

Left adrenal tumor resection was performed and histopathological examination was reported as adrenocortical carcinoma with no extracapsular extension. Post operative CT abdomen was reported to be normal with no residual lesion.

Post surgery outcome was favorable with total disappearance of cushingoid features, hypertension, and clinical virilization.

Discussion

Adrenocortical carcinoma presenting as cushingoid features in early infancy is extremely rare [1.5–2/million] [1].

Most studies show adrenocortical carcinoma having female preponderance [2]. Adrenal carcinoma presents with evidence of adrenal steroid hormone excess in approximately 60% of cases. Most tumors in children are functional and virilization is by far the most common presenting symptom followed by the cushing syndrome and precocious puberty. Rapidly progressing cushing syndrome with or without virilization is the most frequent presentation. Androgen-secreting adrenocortical carcinoma in females presents with deepening of the voice, male pattern baldness, and oligomenorrhea.

Although benign adrenocortical tumors tend to secrete a single class of steroid, ACC can secrete various types;

Fig. 2 Clinical picture of child 3 months post resection of ACC, showing complete recovery

Fig. 3 CT abdomen showing right adrenal cell carcinoma

Fig. 4 MRI abdomen showing left adrenal cell carcinoma

cosecretion of cortisol with androgens is a frequent combination and is highly suggestive of malignancy [5, 8].

Using a logistic regression model, Hussain et al. [7] found a tumor size of greater than 4 cm and heterogeneous enhancement to be the most important discriminators of malignancy. Regarding prognosis, the only clinical parameters that are invariably associated with a poor prognosis are tumor size and resectability [4, 5].

The average survival rate of children with adrenocortical carcinoma is estimated around 50% which increases to 70% when resection is achieved full [3]. The hormonal normalization occurs in the week following surgery and clinical virilization take weeks to months to disappear. Adrenocortical cell carcinoma generally carries poor prognosis and is unlike other tumors of the adrenal cortex which are benign (adenomas) and only occasionally cause Cushing syndrome [6].

References

1. Tauchmanova L, Colao A, Marzano LA, Sparanol, Camera L, Rossa, Palmieri G, Rossi R. Adrenocortical carcinoma: twelve year prospective experience. *World J Surg* 2004, 28: 896–903
2. Ng L, Libertino JM: Adrenocortical carcinoma: diagnosis, evaluation and treatment. *J Urol* 2003, 169: 5–11
3. Riberio RC, Michalkiewicz EL, Figueiredo BC, Delacerda L, Sandrini F, Pianorsky MD et al (2000) Adrenocortical tumors in children. *Braz J Med Biol Res* 33:1225–1234
4. Michalekiewicz E, Sandhni R, Figueiredo BC, Miranda EC, Caran E, Oliveira Filho AG et al (2004) Clinical and outcome characteristics of children with adrenocortical tumors: a report from the International Pediatric Adrenocortical Tumor Registry. *J Clin Oncol* 22:838–845
5. Abiven G, Coste J, L Groussin, Anract P, Tissier F, Legmanoop, et al. Clinical and biological features in the prognosis of adrenocortical cancer, poor outcome of cortisol secreting tumors in a series of 202 consecutive patients. *J.Clin. endocrinol.metab.* 2006;91:2650–55
6. Allolio B, Fassanachtm (2006) Clinical review: adrenocortical cell carcinoma: clinical update, *J clin Endocrinol metab* 91(6):2027–37
7. Hussain S, Belldgrun A, Seltzer SE, Richie JP, Gittes RF, Abrams HL (1985) Differentiation of malignant from benign adrenal masses: predictive indices on computed tomography. *AJR* 144: 61–65
8. Wajchenberg BL, AlbergariaPereira MA, Medonca BB et al (2000) Adrenocortical carcinoma: clinical and laboratory observations. *Cancer* 88:711–736
9. soon PH, Mcdonald KI, Robinson BG, Sindhu SB (2008) Molecular markers and the pathogenesis of adrenocortical cancer. *Oncologist* 13:548–561
10. Libe R, Bertherat J (2005) Molecular genetics of adrenocortical tumors, from familial to sporadic diseases. *Eur J Endocrinol* 153: 477–487