IgA nephropathy is another cause of intermittent gross hematuria that may or may not have associated pain, but a renal biopsy to exclude this lesion was deferred because of absence of dysmorphic RBCs. Moreover, failure to observe hematuria in specimens not collected by the patient’s mother raised suspicion of a diagnosis of factitious hematuria. Ultimately, documentation of RBC antigens in the child’s urine that were identical with the mother’s peripheral blood confirmed the diagnosis of factitious hematuria.

Our patient was known to have three well-documented abnormalities that can cause gross hematuria—hypercalcemia, urinary tract infection, and vesicoureteric reflux. The presence of persistent symptoms with known urinary tract abnormalities made the diagnosis of factitious hematuria less obvious. Although no physical injury was inflicted by the mother, the child was subjected to unnecessary diagnostic procedures, including the risks of radiation, general anesthesia, multiple bladder catheterizations, cystoscopy, hospitalizations, and venipuncture. Finally, the identification of identical RBC surface antigens confirmed the presence of the mother’s blood in the patient’s urine.

Although factitious hematuria is relatively rare in children, it should be included in the differential diagnosis for any child with gross or microscopic hematuria. The diagnosis should be considered even when the occurrence of the hematuria is consistent with a predefined lesion and particularly when appropriate therapy considered effective for the disease fails to alleviate the symptoms.

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Gynecomastia as a Presenting Sign of Fibrolamellar Carcinoma of the Liver

Gynecomastia is generally a benign occurrence in 39% to 67% of the normal adolescent male population. Although the etiology of the breast development is not entirely clear, it may be due to a transient increase in serum estradiol leading to an increase in the estradiol to testosterone ratio. Gynecomasia in adolescent boys may also be associated with a variety of pathologic conditions in which there is an elevation in the estradiol to testosterone ratio. Examples of these conditions include Klinefelter syndrome, congenital anorchia, androgen resistance, orchitis, trauma, congenital adrenal hyperplasia, thyrotoxicosis, starvation, cirrhosis, testicular tumors, adrenal tumors, and primary liver carcinoma. The gynecomastia of hepatocellular carcinoma is thought to be a conse-
quence of increased aromatization of circulating androgens by the liver.6

We recently evaluated a male adolescent with gynecomastia and elevated estradiol levels who was found to have fibrolamellar carcinoma of the liver. No previously published case reports or series have described any endocrinologic abnormalities associated with this less malignant variant of hepatocellular carcinoma.

CASE REPORT

This 13½-year-old white boy had an 18-month history of increasing breast enlargement. He had noticed the development of scant pubic and axillary hair during the previous 2 months without concomitant growth spurt, testicular enlargement, or increase in the length of his penis. There were no complaints of breast tenderness, nipple discharge, headache, polyuria, polydipsia, weight loss, or abdominal pain. He was not taking any medications, nor did he have a history of exposure to hepatitis. There was no family history of endocrinologic or liver disorders.

His height was 159 cm (45th percentile for age), his weight was 54.9 kg (70th percentile for age), and he had scant axillary and pubic hair, symmetric 18-cm diameter breasts with well-developed mammary mammary consistent with a Tanner stage IV female, 2 x 3-cm testes consistent with a Tanner stage II male, a prepubescent penis, and an enlarged, firm, asymmetric, nontender liver which measured 13 cm in total span. The clinical impression was a possible estrogen-producing hepatic neoplasm causing severe gynecomastia.

An ultrasound of the liver showed a solid tumor of the right lobe which measured approximately 15 x 12.5 x 5.5 cm. No metastases were seen on abdominal CT, chest CT, or 99mTc bone scan. A large mass involving the right hepatic lobe, the blood supply to which originated from the right hepatic artery, was visible on an arteriogram.

Results of the patient’s initial endocrinologic evaluation were as follows: triiodothyronine resin uptake 25% (normal 23% to 36%), thyroxine radioimmunoassay 10.2 

µg/dL (normal 5.9 to 13.1 µg/dL), thyroid-stimulating hormone 1.9 µIU/mL (normal <8 µIU/mL), free thyroxine 1.1 ng/dL (normal 0.7 to 1.7 ng/dL), β-human chorionic gonadotropin <5 mIU/mL, serum prolactin <5.0 ng/mL (normal male 0.2 to 9.4 ng/mL), serum testosterone 58 ng/dL (Tanner stage II male 25 to 85 ng/dL; normal adult man 300 to 1,200 ng/dL), 17β-estradiol 6.1

ng/mL (normal adult man 1.0 to 6.0 ng/mL), FSH 4 mIU/mL (normal adult man 7 to 20 mIU/mL; prepubertal <10 mIU/mL), luteinizing hormone <2 mIU/mL (normal adult man 6 to 17 mIU/mL; prepubertal <10 mIU/mL), and a buccal smear which was negative for Barr bodies. Additional test results were: normal CBC, prothrombin time, and partial thromboplastin time; aspartate aminotransferase 32 IU/L (normal 15 to 35 IU/L); alanine aminotransferase 17 IU/L (normal 1 to 30 IU/L); total protein 8.1 g/dL (normal 6.5 to 8.6 g/dL); total bilirubin 0.2 mg/dL (normal 0.3 to 1.2 mg/dL); direct bilirubin 0.0 mg/dL; alkaline phosphatase 198 IU/L (normal 48 to 323 IU/L); repeat β-human chorionic gonadotropin <5 mIU/mL; α-fetoprotein <10 ng/mL (normal 0 to 10 ng/mL); carcinoembryonic antigen <0.1 ng/mL; negative hepatitis B surface antigen assay; and estradiol 106 pg/mL (normal adult man 20 to 90 pg/mL).

An exploratory laparotomy was performed and the presence of an approximately 8 x 10-cm mass involving the right hepatic lobe was confirmed; there was no evidence of intraabdominal metastases. The tumor, along with a border of normal liver tissue, was easily removed. Two enlarged lymph nodes at the porta hepatitis were histologically normal. The patient tolerated the procedure well and had an uneventful postoperative course. Adjuvant chemotherapy consisting of Adriamycin, Cisplatinum, and 5-fluorouracil was started soon after surgery. Five months after removal of the tumor, the patient is alive and well with no evidence of recurrence or metastases.

Pathologic evaluation of the tumor revealed plump, eosinophilic neoplastic hepatocytes surrounded by abundant fibrous stroma (Fig 1) which was consistent with fibrolamellar carcinoma of the liver. Immunohistochemical staining with a polyclonal carcinoembryonic antigen antibody was positive for hepatocellular differentiation. The tumor also stained strongly for α1-antitrypsin and many cells stained for ferritin. Estrogen receptor staining was equivocal. A stain for α-fetoprotein was negative. Postoperative changes in estradiol and testosterone are

![Fig 1. Photomicrograph of portion of tumor. Note hepatocytes surrounded by lamellated fibrous stroma (hematoxylin and eosin stain; ×100).](image-url)

![Fig 2. Significant opposing changes in estradiol and testosterone levels after resection of tumor.](image-url)
noted in Fig 2. There was a striking decline in the plasma estradiol concentration from 106 pg/mL preoperatively to a level of less than 25 pg/mL by the 28th postoperative day. Concomitantly, there was a marked increase in the serum testosterone concentration from 58 ng/dL preoperatively to 395 ng/dL by the 46th postoperative day.

DISCUSSION

Based on pathologic and clinical features, fibrolamellar carcinoma of the liver is a distinct variant of hepatocellular carcinoma. Histologically, this tumor is characterized by plump, deeply eosinophilic malignant hepatocytes and abundant laminated fibrous stroma. Furthermore, approximately half of the tumor cells described in the series by Craig et al. also contained cytoplasmic pale bodies. Teitelbaum et al. demonstrated that this fibrous stroma was positive for fibrinogen; fibrinogen is not found in typical hepatocellular carcinoma. They also demonstrated positive staining for α1-antitrypsin and negative staining for α-fetoprotein of the tumors in their series; typically, α1-antitrypsin is found in 73% of hepatocellular carcinomas, whereas 33% stain for α-fetoprotein. The tumors also contained large amounts of copper, whereas only small amounts of copper are present in typical hepatocellular carcinomas.

Clinically, fibrolamellar carcinoma of the liver affects mainly adolescent and young adult men and women equally who have no predisposition for hepatic malignancies. The histologic features of our patient's tumor and his age are similar to previously reported patients with fibrolamellar carcinoma of the liver. In contrast, typical hepatocellular carcinoma affects men in the 50- to 60-year age range with a history of cirrhosis or exposure to hepatitis B.

Unlike previous patients with fibrolamellar carcinoma of the liver who had symptoms of abdominal pain, malaise, and occasionally the discovery of an abdominal mass, our patient's complaint was gynecomastia. Gynecomastia in healthy adolescent boys is common. In a study consisting of 1,870 adolescent boys, Nydick et al. described gynecomastia in 39% of this population but did not present a cause for the gynecomastia. However, LaFranchi et al. described six of 16 patients with gynecomastia who had elevated estradiol levels ranging from 44 to 180 pg/mL. Eleven of these 16 boys also had high estradiol to testosterone ratios for their stages of development. Further elucidation of a possible mechanism was provided by Lee who attributed gynecomastia in normal adolescent boys to dynamic changes in hormonal levels. He longitudinally followed 29 boys through Tanner stages II to IV. Gynecomastia developed in 20 of these 29 boys. He discovered significantly elevated levels of estradiol in the boys with gynecomastia when compared with control, matched, boys at the same Tanner stage. Furthermore, there was a significant increase of estradiol and a relatively small increase in testosterone with the onset of gynecomastia, resulting in increased estradiol to testosterone ratios. In the studies by Lee and LaFranchi et al., it was postulated that the estradiol was produced by peripheral aromatization of testosterone.

The most likely mechanism for our patient’s elevated estradiol was aromatization of circulating androgens by the liver tumor. By using a reversed isotope dilution technique with crystallization to constant specific activity, Kew et al. demonstrated aromatization of the adrenal androgens, dehydroepiandrosterone sulfate and dehydroepiandrosterone, to estrone and estradiol by a typical hepatocellular carcinoma. We postulate this mechanism was the reason for our patient’s elevated estradiol concentration and subsequent gynecomastia. Like the patient of Kew et al., our patient had physical signs of adrenarche, early pubertal testes, and a low pubertal level of testosterone. Our patient also had prepubertal FSH and luteinizing hormone levels; however, only a single level of each hormone was measured. Our postulation is further strengthened by the rapid decrease in the estradiol level and increase in testosterone after removal of the tumor (Fig 2). Thus, peripheral aromatization of the testicular androgen testosterone to estradiol cannot explain our patient’s elevated estradiol level. This rapid reversal in hormonal levels also suggests that the estradiol may have exerted a negative feedback on gonadotropin release.

Fibrolamellar carcinoma of the liver has a much better prognosis than typical hepatocellular carcinoma. This variant of hepatocellular carcinoma is associated with survival rates of 32 to 68 months. This differs dramatically from the average survival rate of 5.9 ± 0.7 months for patients with hepatocellular carcinoma. Berman et al. also reported that at 2 and 5 years after diagnosis, 82% and 63%, respectively, of patients with the fibrolamellar variant were still alive. Typical hepatocellular carcinoma in the pediatric population has a 33% long-term survival rate if the tumor is completely excised.

In summary, we have described the first case of gynecomastia associated with fibrolamellar carcinoma of the liver. This tumor has a distinctive histologic morphology and staining characteristics compared with typical hepatocellular carcinoma. Thus, preoperative identification of this tumor should be attempted when presented with an adolescent or young adult with gynecomastia and a hepatic mass. Positive identification can then lead to an aggressive surgical approach. Total surgical
Palatal Burn Due to Bottle Warming in a Microwave Oven

Infections, tumors, nutshells, and foreign bodies may all be seen clinically as unusual lesions of the palate in children.\(^1,2\) We describe the case of an infant girl who had a palatal lesion, eventually determined to be secondary to a scald burn. We emphasize this case because the eventual diagnosis was not considered until almost 2 months after the patient was first seen, at which time additional history was elicited.

CASE REPORT

C.P. was a 4-month-old girl referred to our hospital for evaluation and treatment of poor weight gain with a palatal lesion. She was delivered by cesarean section for cephalopelvic disproportion after an uncomplicated full-term pregnancy; her birth weight was 3,820 g (90th percentile). At 6 weeks of age she was hospitalized for seven days with a respiratory illness and treated with antibiotics and steroids. Several days after discharge, her parents noticed a blister on her palate. Subsequently, feeding refusal developed in the infant and she was hospitalized locally for poor weight gain, inadequate intake, and a palatal lesion. No infectious (viral, bacterial, or fungal) or pathologic causes were identified. Biopsy of the lesion indicated chronic nonspecific inflammation. Because of continued poor intake and an apparent lack of healing of the lesion, the infant was transferred to our hospital.

Her height was at the 25th percentile and her weight and head circumference were at the 50th percentile. She was alert, quiet, and appropriately interactive for her age. Her hard palate appeared intact; the uvula was midline. There was a deep cleft just to the left of midline on the soft palate. It was slitlike in appearance with an ulcerative yellow exudate. There were no other aberrant findings.

On the second hospital day, the baby was examined under anesthesia, at which time biopsies and cultures of the palatal lesion were obtained. An ulcerative lesion was identified, with distinct borders on the soft palate that extended well onto the hard palate. There was a small full-thickness defect in the soft palate (Figure). Laboratory test results, including CBC, chest roentgenogram, quantitative immunoglobulins, antitetanus antibodies, antipertussis antibodies, VDRL, and ESR, all were within

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