Diffuse Neonatal Hemangiomatosis Successfully Treated with High Dose Corticosteroid

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Diffuse neonatal hemangiomatosis is a fatal disorder characterized by multiple cutaneous and visceral hemangiomas. The organs most commonly affected are the gastrointestinal tract, brain, liver and lung. The complications are high output cardiac failure, gastrointestinal bleeding and hydrocephalus.

We present a patient with diffuse neonatal hemangiomatosis associated with massive hepatic involvement and high output cardiac failure, which was successfully treated with high dose corticosteroid. (Ann Dermatol 10:(2) 112~115, 1998)

Key Words : Hemangiomas, High output cardiac failure, Corticosteroid

Vascular tumors and malformations are among the most common cutaneous conditions of the neonatal period[1]. The presence of multiple cutaneous lesions with life-threatening multisystem internal involvement has been termed diffuse or disseminated neonatal hemangiomatosis[2]. Death most often occurs in cases of hemorrhage from hemangiomas in the upper respiratory or gastrointestinal tract. It also occurs in cases of high output congestive heart failure due to arteriovenous shunting in the liver and lungs[3]. We report a case of diffuse neonatal hemangiomatosis treated with high dose corticosteroid.

CASE REPORT

A two-month-old girl was hospitalized for severe respiratory distress, cough and dyspnea. Physical examination revealed dehydration and cyanosis with numerous papules and nodules measuring from 0.8 cm to 1.8 cm on the face, trunk and extremities. They were non-blanching, dark red to purple and hard in consistency (Fig.1). Her heart rate was 152 beats/min, and a systolic ejection cardiac murmur was auscultated.

The liver was palpable 4 to 5 cm below the costal margin. A 3 mm-sized punch biopsy specimen of a truncal red papule showed minimal irregular endothelial hyperplasia. Many vascular spaces were found in the whole dermis. These were lined by plump endothelial cells, consistent with a capillary hemangioma (Fig. 2).

Laboratory evaluation revealed that a complete blood count including thrombocytes, prothrombin time, partial thromboplastin time, liver function test, occult blood in stool, and urine analysis were within normal limits, or negative. A chest radiogram showed cardiomegaly and pulmonary vascular engorgement. An ECG showed a sinus tachycardia of 155/min and left ventricular hypertrophy. The echocardiogram showed asymmetric septal hypertrophy with ventricular overload and high output cardiac failure. Abdominal ultrasonography demonstrated multiple uniform sized sonolucent areas in both lobes of the liver (Fig.3). The brain computed tomographic scan and skeletal radiographic survey showed no abnormalities.

At the time of admission, she was given high dose of oral prednisone (3 mg/kg/day) along with diuretics and digitalis to improve cardiac function. After one week of therapy, the patient's cardiac murmur was decreased and mild cyanosis was ob-

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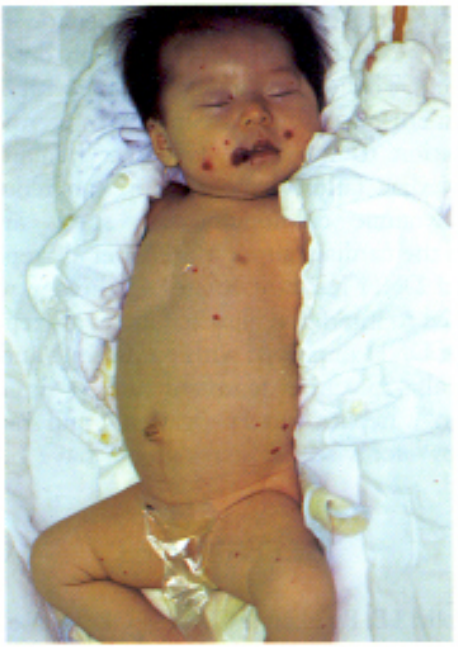

Fig.1. Multiple dark red to purple, various sized papules on the face, trunk and extremities.

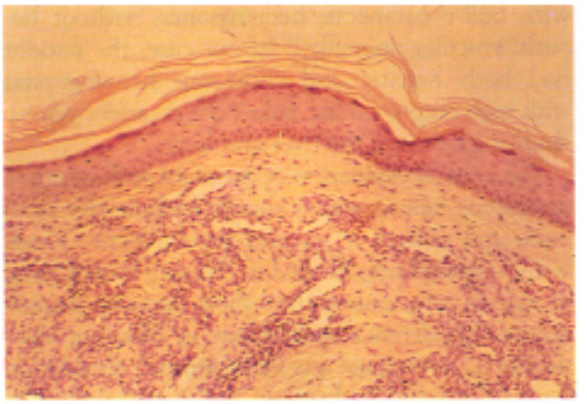

Fig.2. Slight proliferation of endothelial cell lined vascular spaces in the papillary and reticular dermis.

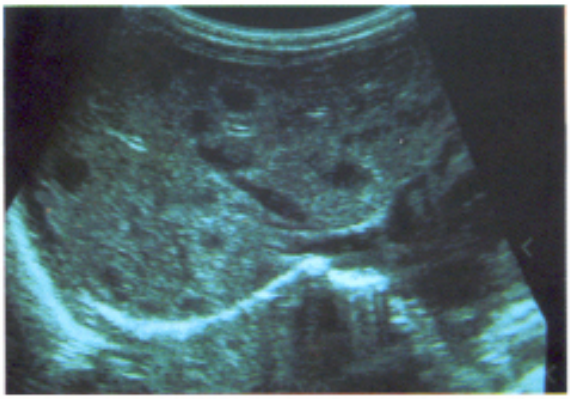

Fig.3. Abdominal ultrasonography demonstrated multiple sonolucent areas, in the entire area of both lobes of the liver.

served. However, the repeated abdominal ultrasonography remained unchanged, thus steroid therapy was continued. After two months of therapy, it was tapered to 2 mg/kg/day. By that time an echocardiogram and abdominal ultrasonography showed a significant regression of the vascular abnormality. After four months of therapy, the steroid was discontinued. The cutaneous and hepatic hemangiomas had almost disappeared and no signs of cardiac failure were evident.

DISCUSSION

Diffuse neonatal hemangiomatosis (DNH) is characterized by multiple cutaneous and visceral hemangiomas[2]. The natural course of DNH is progressive vascular proliferation especially during the first 6 months of life and early death in infants with multiple organ involvement[5].

Benign neonatal hemangiomatosis (BNH) is multiple cutaneous hemangiomas associated with limited or asymptomatic visceral involvement and follow a benign course[3]. The mortality rates in infants with extensive visceral involvement have been estimated as high as 95% without treatment[3,4]. Commonly involved visceral organs are the liver, lung, heart, gastrointestinal tract, spleen, thymus, kidney, thyroid, uterus, ovary and brain; however, any organ may be involved[1]. The visceral hemangiomas may appear as arteriovenous fistulas with significant shunting of blood through the lesion causing high output cardiac failure[6]. Massive hemorrhage can occur either from direct bleeding of the hemangiomas[7], consumptive coagulopathy[1], or thrombocytopenia (Kasabach-Merritt syndrome)[8,9]. The liver is reported to be the most common site of visceral involvement[10]. In some infants, only hepatic involvement with solitary or multiple hemangiomas is observed, while others have reported with both cutaneous and hepatic angiomatosis.[11-13]

The congestive heart failure with ventricular hypertrophy, increased cardiac output and pulmonary vascularization as detected by chest radiography is often associated with hepatic angiomas or

with bulky cutaneous hemangiomas without hepatic vascular anomaly.[14] In our case, the patient had both hepatic and cutaneous hemangiomas with high output cardiac failure due to arteriovenous shunting between the liver and lung.

The clinical evaluation of an infant with multiple cutaneous hemangiomas should include the presence and extent of visceral involvement. Those with hemangiomas limited to the skin have a good prognosis, and unless they show signs of cardiac failure, interference with vision, or bleeding, they usually do not require specific treatment[1]. Evaluation for tachycardia, tachypnea, hepatosplenomegaly, and bruits over the liver may give some clue to the presence of visceral involvement and high output cardiac failure. Also, physical examination should include neurologic and ophthalmologic tests.

A complete hematologic work up should be done, and examination of urine and stools for occult blood is necessary. A chest X-ray may show cardiomegaly or pulmonary vascular engorgement, and sometimes reveals the presence of hemangiomas in the lung parenchyma. An echocardiogram is a useful and non-invasive tool for the diagnosis of high output cardiac failure. Ultrasonography is valuable for localizing hepatic hemangiomas and detecting hydrocephalus, which can be a complication of intracranial hemangiomas. Computed tomographic scanning is preferred to find the intracranial hemangiomas, and can detect intrathoracic and intraabdominal involvement[6].

Prednisone, in dosages of 2 to 4 mg/kg/day, has been recommended for infants with evidence of visceral involvement with high output cardiac failure[1]. It is given at a full dose for one month and then slowly tapered[15]. Our patient was initially treated with prednisone 3 mg/kg/day. After two months of therapy, it was tapered to 2 mg/kg/day and continued for two more months. Digitalization is indicated if there are signs of significant heart failure[1]. A combination of aspirin and dipyridamole may be beneficial in patients with evidence of platelet trapping[21]. The mechanism by which steroids induce a regression in size and degree of intrahemangiomatous shunting is not clear. It has been suggested that proliferating blood vessels are sensitized to endogenous circulating vasoconstrictors by the steroids[16]. Another theory is that steroids occupy receptors in hemangioma tissue and block factors involved in its growth[17]. Glozal et al[6] reported a case of cutaneous and hepatic hemangiomas successfully treated with high dose corticosteroid. Touloukian[22] reported a case with liver involvement successfully treated with steroids and irradiation to the liver. For liver hemangiomas and cardiac failure, embolization can reduce the hyperdynamic cardiopulmonary status and decrease the cardiac output[18]. Spiller et al[19] reported a case of DNH resistant to steroid therapy who responded to interferon alfa-2a. Cho et al[20] reported a case of DNH improved with prednisone and interferon alfa-2a. Other teatment such as surgical resection[16], hepatic artery ligation[23] and radiation therapy[13] for visceral hemangioma have been reported.

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