Implantation of a cardiac pacemaker to circumvent complete heart block in a life-threatening hemangioma to allow the use of propranolol

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Key words: cardiac pacemaker; infantile hemangioma; propranolol.

INTRODUCTION

Infantile hemangioma (IH) is the most common tumor of infancy, affecting up to 4% of infants with 40% requiring treatment because of cosmesis or compromise to vital structures or function, such as airway or vision.[1,2] Approved by the US Food and Drug Administration in 2014, propranolol is now considered the treatment of choice for complicated IHs and practically replaced all historic treatments like systemic steroids.[3] Here we report a on preterm boy born with life-threatening parotid IH and congenital complete heart block (CCHB) owing to maternal systemic lupus erythematosus (SLE) who was treated successfully with propranolol after implantation of a cardiac pacemaker (CP).

Abbreviations used:

CCHB:	congenital complete heart block
CP:	cardiac pacemaker
IH:	infantile hemangioma
SLE:	systemic lupus erythematosus

REPORT OF A CASE

A 30-week premature baby boy, born to a mother with SLE, was delivered by cesarean section because of fetal distress. He was immediately admitted and intubated in the neonatal intensive care unit (NICU) because of respiratory distress and possible sepsis. Birth weight was 1.3 kg, and APGAR score was 3 and 5 at 1 and 5 minutes, respectively. Electrocardiogram and echocardiography and at birth found CCHB with constant bradycardia of 60 beats per minute (bpm). At the age of 1 week, a rapidly growing IH was noticed in the right parotid area, which grew and extended to the neck potentially threatening the airway (Fig 1). To stop the progression of the IH, systemic steroids and propranolol were considered but deemed contraindicated because of ongoing *Klebsiella* pneumonia and sepsis for the former and CCHB for the latter. The alarming rate of growth of this parotid IH, which was projected to threaten the neck structures and the airway, represented a therapeutic challenge. After discussions among the dermatology, pediatric cardiology, and neonatology departments, a permanent CP was implanted at 3 weeks of age, which immediately restored and maintained the heart rate to 110 bpm. One day later, oral propranolol was initiated at dose of 0.5 mg/kg/d divided 3 times a day then escalated successfully over a few days to 2 mg/kg/d divided 3 times a day without any adverse events and with heart rate maintained unaffected at 110 bpm. The IH started to regress, so the patient was discharged from the neonatal intensive care unit 4 weeks later. Propranolol was continued over the next 12 months with regular outpatient follow-up with excellent regression (Fig 2). Written informed consent to publish photographs was obtained from parents.

DISCUSSION

Although benign, IHs can be organ or life threatening when they compromise or encroach on the visual axis or the airway.[4] Treatment of such

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Fig 1. IH. Photograph of the patient shows right parotid IH at 1 week of age.

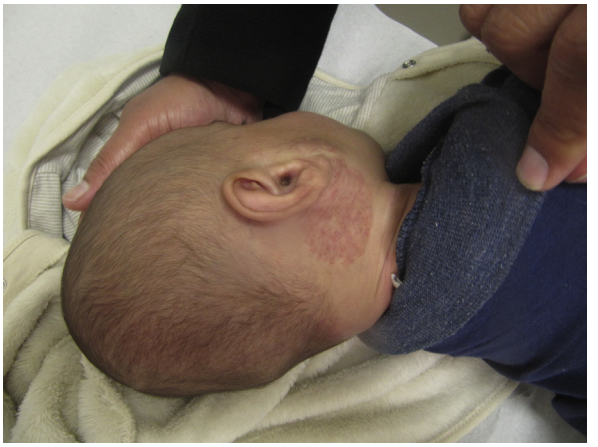

Fig 2. IH. Photograph of the patient at 6 months of age showsing the regression of IH on propranolol treatment.

IH requires an early aggressive approach to prevent airway or vision obstruction.[2] Systemic steroids were the mainstream systemic treatment until the advent and US Food and Drug Administration approval of propranolol in 2014.[3] Propranolol's mechanism of action on IH remains uncertain, but many hypotheses were suggested including initial vasoconstriction followed later by inhibition of angiogenesis.[4,5] Well-known but rare side effects include bradycardia, hypotension, hypoglycemia, bronchial constriction, and sleep disturbances.[2] Contraindications to propranolol therapy include preexisting bradycardia, hypotension, heart block or failure, asthma, or sensitivity to the drug.[2] Propranolol and other β-blockers were deemed contraindicated in our patients because of CCHB, which was attributed to the preexisting maternal SLE. Moreover, systemic steroids were also deemed contraindicated because of ongoing neonatal sepsis. Because of the alarming rapid growth of the IH with encroachment on airways and projected further growth, the use of propranolol was considered lifesaving, and insertion of CP was justified to circumvent the existing CCHB, which was successful in preserving a fixed heart rate and rhythm, which were unaffected during propranolol treatment.

This case represented a therapeutic challenge and suggests that implantation of a CP can be considered to allow the use of systemic β-blockers circumventing CCHB in life-threatening IH when other options are contraindicated.

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