



CASE STUDY ON THE USE OF POCUS AND TELEMEDICINE TO AID DIAGNOSIS AND MANAGEMENT OF CONGENITAL CARDIAC DISEASE IN A LOW RESOURCE SETTING

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INTRODUCTION

Congenital cardiac disease is a common condition in Yemen, yet paediatric cardiac services are limited, with few available diagnostic services and limited access to cardiac surgery. Basic Point of Care Ultrasound (POCUS) has been implemented by Médecins Sans Frontières (MSF) in Al-Salaam Hospital in North Yemen to aid diagnostic capacity, with the support of the MSF Telemedicine platform.



Figure 1: Chest x-ray showing cardiomegaly

CASE DESCRIPTION

25-day-old male patient with 3-day history of poor feeding, lethargy and fever. Born at term in good condition, with symptoms present from his third week of life only. Upon admission he had signs of respiratory distress with nasal flaring, subcostal recessions and tracheal tug, alongside circulatory compromise with pallor, mottled peripheries and tachycardia. He was initially treated as a suspected respiratory tract infection with sepsis, commenced on High Flow Nasal Cannula (HFNO) and intravenous antibiotics. However a cardiac condition was suspected due to the presence of a heart murmur on auscultation, and as the oxygen saturations did not improve with the administration of oxygen. A chest x-ray showed cardiomegaly (**Figure 1**). A 5-view cardiac POCUS exam was performed by one of the MSF POCUS clinicians and the case and images uploaded to the MSF telemedicine platform (**Figures 2 and 3**). A Paediatric Cardiologist was then able to diagnose Hypoplastic left heart syndrome (hypoplastic left ventricle with dilated right ventricle and atrium) based on the acquired basic imaging by the field team and provided clear information on the extremely poor prognosis for this child, even if surgical facilities were available. Given this diagnosis in a resource-limited context, the medical team was able to decide upon the most appropriate management (palliative care) and to speak with the family. Medical treatment was rationalised, HFNO weaned and antibiotics de-escalated, and the child was finally discharged home as per the family's wishes. Although a cure for this child wasn't possible, knowing the exact diagnosis and prognosis was extremely important to both the medical team and the family to prevent unnecessary treatment and procedures as well as enabling the family to have precious time at home with their child.

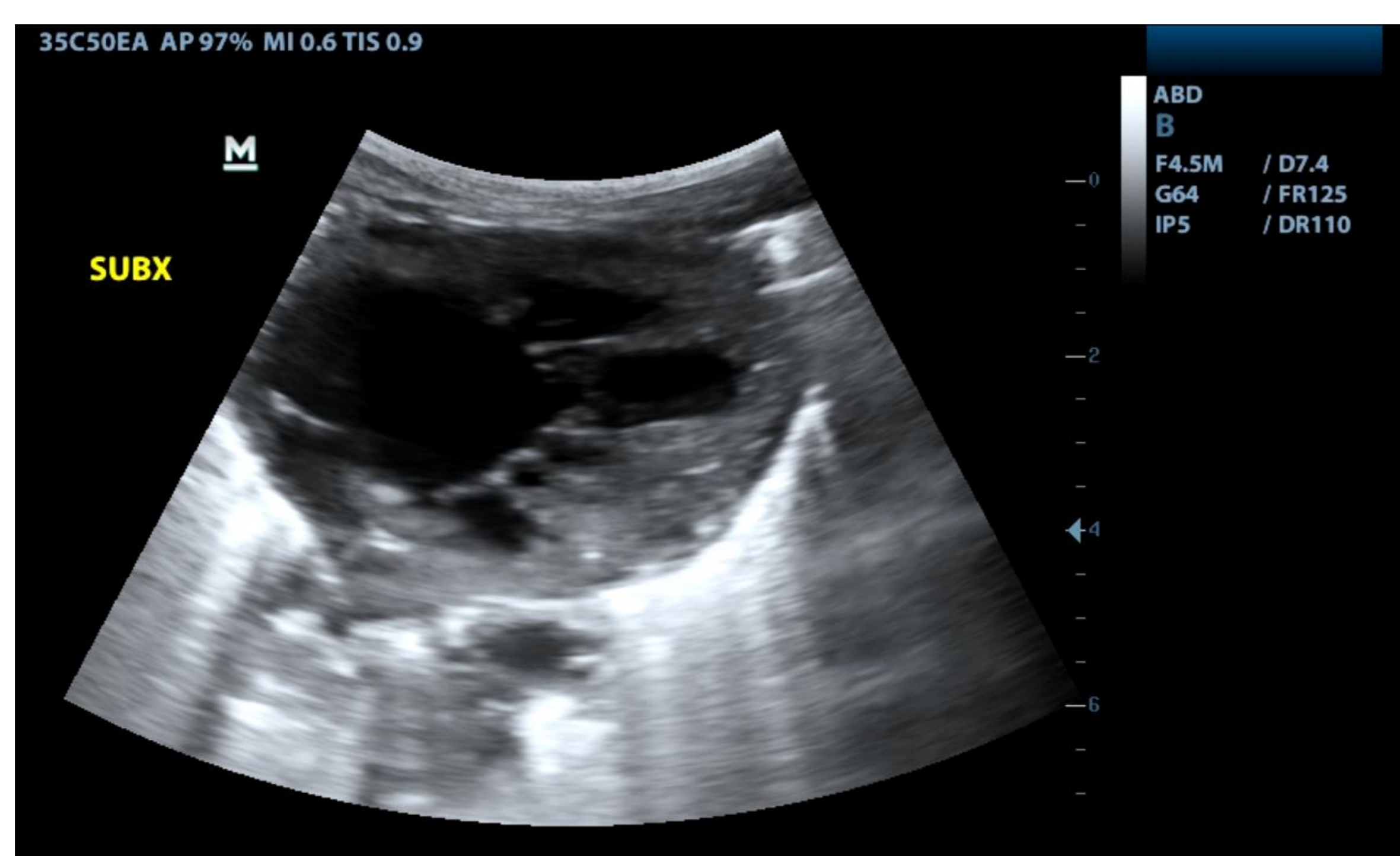


Figure 2: Subxiphoid cardiac view : dilated right atrium and ventricle, left ventricle slit-like (almost invisible here)

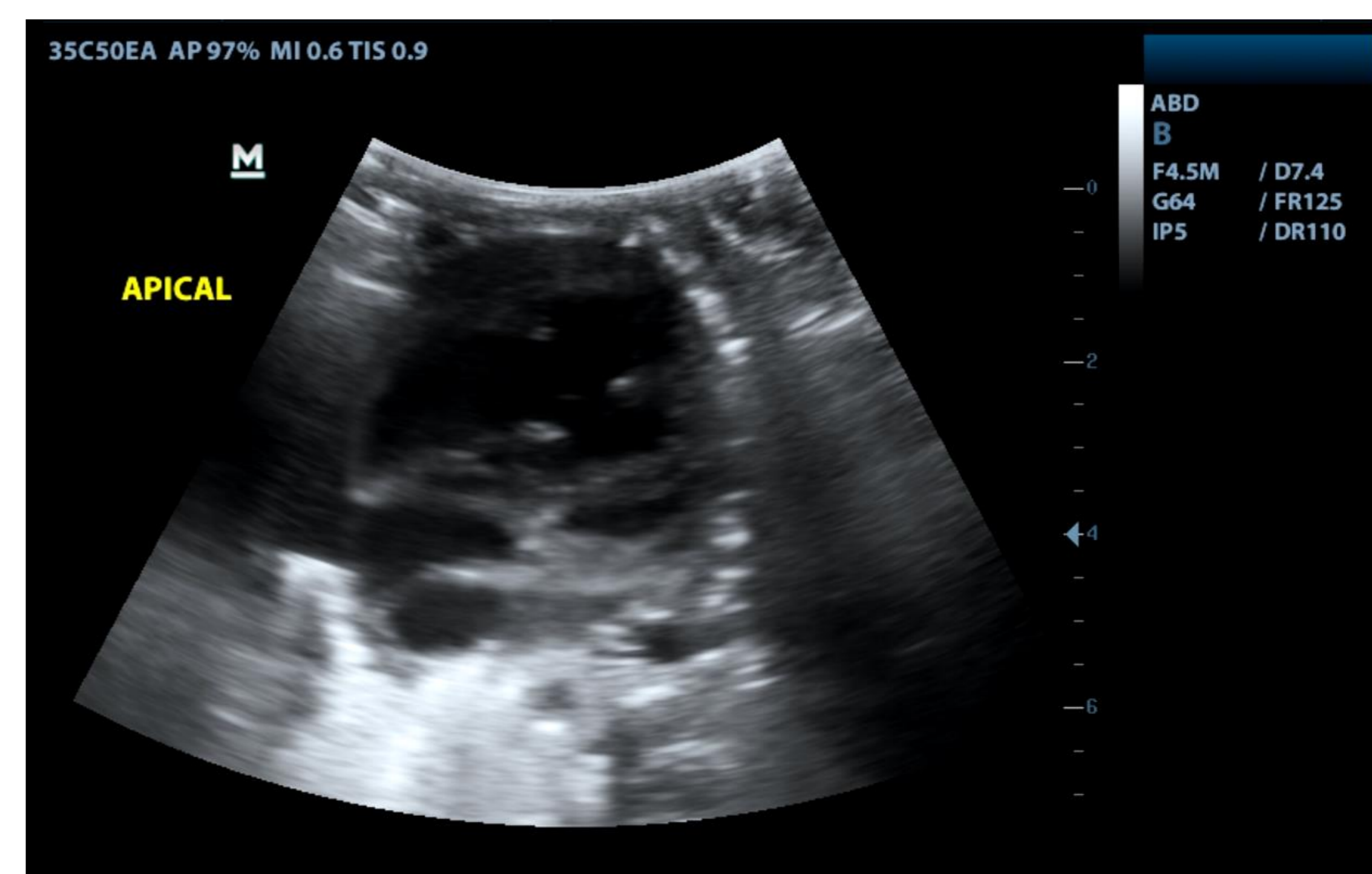


Figure 3: Apical view: shows one big single ventricle

DISCUSSION

The use of basic POCUS together with expert consultation using the MSF Telemedicine platform transformed the management of severe paediatric cardiac disease in our MSF project. An accurate diagnosis, even if not curable, can facilitate discussions with parents around prognosis and management options which can be adapted to our context, and can aid medical decision making (including appropriate de-escalation of treatment in a palliative situation) in a multidisciplinary manner. Basic POCUS trainings are being provided to MSF field clinicians worldwide to contribute to better medical care for our patients.

ETHICS STATEMENT

Fulfils the exemption criteria set by the MSF ERB and was approved for submission by the OCP Medical Director.