Clinics Mother Child Health 2018, Volume:15
DOI: 10.4172/2090-7214-C1-003

Tetralogy of Fallot cases: prone to be affected by malignancies or just a coincidence?

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Introduction: Primary osteosarcoma (OS) is the most common primary malignant tumor of bones, accounting for approximately 20% of primary bone cancers and predominantly affects patients younger than the age 20. Although it seems that the tendency of developing malignancy in patients with congenital heart defects has been well documented, association of osteosarcoma and tetralogy of Fallot (TOF) is rarely reported. We now present a rare association of surgically repaired TOF with osteosarcoma.

Case presentation: An 8.5-years-old Fars boy with history of repaired TOF one year back was admitted to the Gorgan Taleghani Pediatric Hospital with complaint of refractory unilateral leg pain most frequently at nights. After corrective surgery of TOF one year back, he has been following with electrocardiography (ECG) and echocardiography. He tolerated two major complications: right bundle branch block (RBBB) and severe pulmonary regurgitation (PR) without indications of pulmonary valve replacement. About one year later after surgery, the patient presented to our clinic for recently annoying left lower limb pain. While there was no known description associated with TOF itself or with complication of corrective surgery, initially the pain was attributed simply to the patient's flat soles. But the pain was nonresponsive, hence diagnostic approach accomplished step by step. Radiography showed mass in his proximal part of left fibula. Computed tomography, bone scan and bone biopsy of the proximal part of the left fibula revealed: high grade intramedullary osteosarcoma (OS) of osteochondroblastic type. Chemotherapy with methotrexate, cisplatin, Adriamycin was started. In the meantime, due to Adriamycin he got bradycardia and actinomycin replaced Adriamycin. After three months of chemo-treatment, the patient was referred to surgeon for fibula resection. The pre-operation metastasis survey including CT scans and PET scan was negative for any metastasis or regional organ involvement. The surgery was successfully carried out and postoperative chemotherapy started again with Pediatric Oncology Group (POG8651) protocol for OS. After surgery, agenda was cardio-toxic chemotherapeutic agents which could exacerbate compensated right ventricular function in spite of free pulmonary valve regurgitation (free PR) and RBBB. After modulating chemotherapy plan and selecting the least cardio-toxic drugs, actinomycin replaced Adriamycin here in our case with cardiologic consultation. Chemotherapy was continued with closed clinical observation. The patient has been followed up with echocardiography and electrocardiography (ECG) at regular intervals and before each session of chemotherapy. His chemotherapy was completed 13 months ago. No significant cardiac complications or recurrence of OS have occurred during recent year-follow up. So, this case showed that osteosarcoma may be associated with TOF. It would be interesting for clinicians to have in mind such tendency between TOF and OS to investigate if they share any origin genetically or developmentally.

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