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## Case report - Congenital

# Intractable tinnitus and sensorineural deafness cured by surgical correction of coarctation of aorta

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## Abstract

Tinnitus is a challenging condition to manage with no effective treatment. We report a case of lifelong tinnitus present in a patient who was cured with the surgical repair of his coarctation of aorta. The patient was a fit 37-year-old with coarctation of aorta, sensorineural deafness and intractable tinnitus. He underwent a thoracotomy and tube by-pass of his coarctation of aorta. A complete relief of his tinnitus and improvement in his hearing was noted postoperatively and confirmed on audiograms. This is the first reported case of tinnitus due to coarctation of aorta relieved by surgical correction of the coarctation.

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**Keywords:** Coarctation; Tinnitus; Sensorineural deafness

## 1. Introduction

“Coarctation of aorta is a congenital narrowing of the upper descending aorta adjacent to the site of attachment of the ductus arteriosus, which is sufficiently severe to cause a pressure gradient across the area” [1]. Isolated coarctation of aorta in adults is associated with hypertension, heart failure and more often is discovered as diminished femoral pulses and cardiac murmur on a routine clinical examination. We report a case of coarctation of aorta associated with tinnitus and bilateral sensorineural deafness, which were relieved after the surgical correction of his coarctation.

## 2. Case report

A fit 37-year-old with coarctation of aorta with an acute syncopal episode while driving was referred to our institution for surgery. A diagnosis of coarctation of aorta

was made 5 years previously and anti-hypertensive medication was started. He had severe objective tinnitus and bilateral sensorineural deafness of 50 dB all his life. A CT scan of the brain done after the syncopal episode did not reveal any lesion. He was otherwise fit and did cycling as a hobby.

On examination his general condition was good. His heart rate was 78 beats per min in sinus rhythm. Blood pressure was 150/92 mmHg. He had an ejection systolic murmur in the left sternal edge. His femoral pulses were good but delayed, and his dorsalis pedis pulses were diminished on both sides. Haematological and biochemical parameters were within normal limits. Chest radiograph showed rib-notching. An aortogram revealed a coarctation of the aorta just distal to the origin of the left subclavian artery with a trans coarctation gradient of 40 mmHg.

Under general anaesthesia, the patient was placed in right lateral position. Thoracotomy was performed through the fifth inter-costal space. The posterior pleura was incised. The findings were coarctation of the descending aorta, 4 cm distal to the origin of the left subclavian artery. There was a marked thrill across the coarctation and several inter-costal vessels of 6–7 mm were present. The distal pressures were 20 mmHg less than the radial

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artery pressures. Tapes were placed around the arch and the descending aorta. The inter-costal arteries were controlled with silastic slings. On test occlusion there was a significant depression of pressures in the lower limb, hence a decision was made to bypass the coarctation. The coarctation was repaired using partial clamps and a 20 mm Gelseal tube graft bypass. During partial occlusion a distal mean pressure of 70 mmHg was maintained. The coarctation was ligated after the bypass procedure to avoid aneurysm formation.

He was extubated after 2 h in the intensive care unit. On regaining consciousness he noticed his lifelong tinnitus had completely disappeared and his hearing improved. There were no neurological complications.

His blood pressure on discharge was 130/90 mmHg. He was on atenolol 50 mmHg once a day. A postoperative audiogram was performed and it showed his sensorineural hearing restored to normal (Fig. 1). Preoperatively he had a 50 dB loss. He is asymptomatic after 3 years without any anti-hypertensive medications.

### 3. Discussion

Coarctation of aorta is present in about 50 per 100,000 live births [1]. Coarctation of aorta in adults usually presents in the post-ductal region. The presenting symptoms of patients with coarctation is predominately uncontrolled hypertension, cardiac failure, visual disturbances, and poor distal circulation. There is an association with berry aneurysms and they may present with haemorrhage and stroke, but no mention has been made of an association between coarctation and tinnitus in the literature.

Tinnitus is defined, as any abnormal noise perceived in the absence of external acoustic stimulus; this can further be classified as objective or subjective tinnitus [2]. Subjective tinnitus is tinnitus perceived only by the patient. Objective tinnitus refers to sound wave energy, which may be perceived and recorded by an examiner [3]. Objective tinnitus is rare and it is either due to turbulent blood flow or contractions of the palatal or stapedial

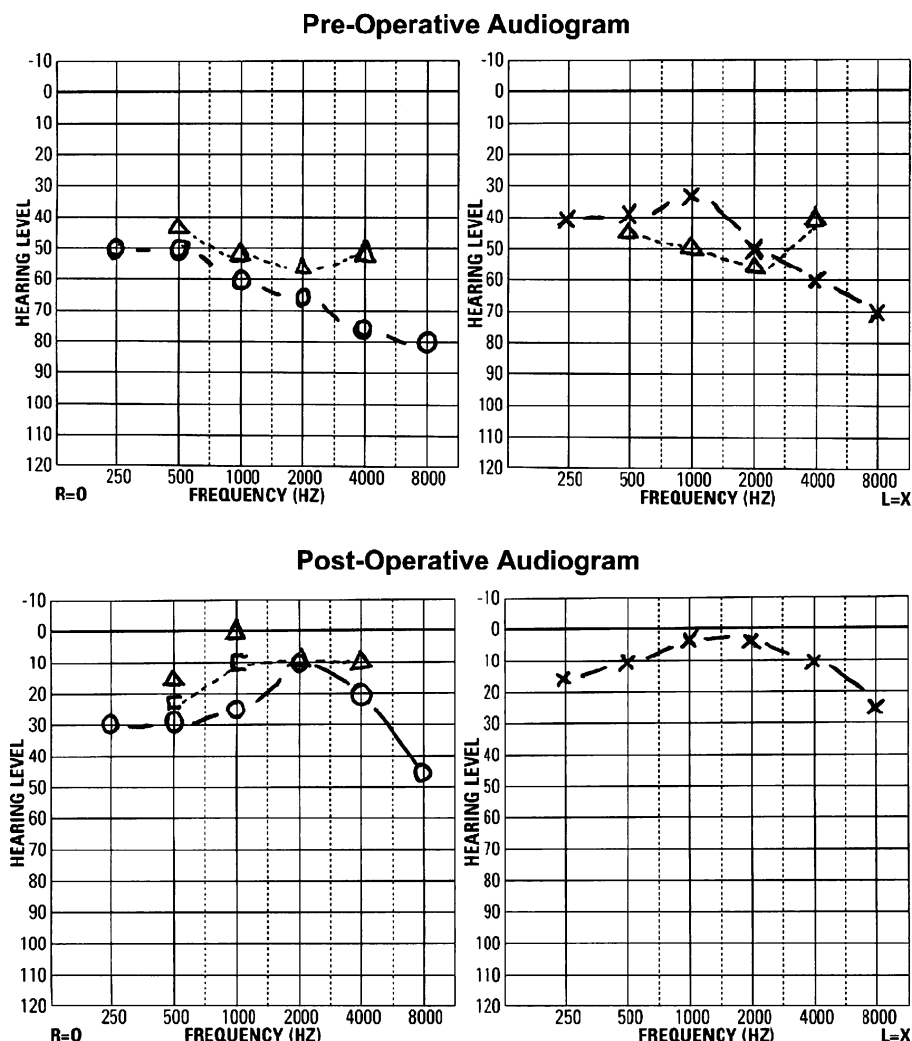


Fig. 1. Audiograms before and after the coarctation repair. The audiogram demonstrates the improvement in the hearing. The right ear is denoted by ○ and the left ear as × with the unmasked conduction is recorded as Δ.

smooth muscles [3]. The characteristics of tinnitus is multiple and varied. It may be low or high pitched, buzzing or ringing, loud or soft, paroxysmal or constant [2]. Pulsatile tinnitus is the result of the sound of non-laminar blood flow transmitted to the cochlea [4]. It almost always coincides with the heart rate. The causes include arteriovenous shunts, arterioarterial shunts and intraluminal irregularities. Most often the intraluminal causes are due to carotid stenosis [3].

Evaluation includes a thorough history, complete head and neck evaluation and otological examination with audiometry. Doppler scans, MRI and angiograms are further investigative options [3]. Treatment options depend on the cause.

The possible cause of tinnitus in our patient is the turbulent flow across the coarctation conducted into the carotid arteries to cause tinnitus and sensorineural deafness.

His lifelong intractable pulsatile tinnitus and sensorineural deafness resolved completely following a tube bypass for the aortic coarctation.

To the best of our knowledge there have not been any reports in the literature with coarctation of aorta as a cause of pulsatile tinnitus, which was resolved after surgical correction.

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