

## **A Rare Association: Pierre Robin Sequence with HMG CoA Lyase Deficiency and Duplication of Short Arm of Chromosome 17**

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### **Abstract**

We present a term, baby girl with Pierre Robin Sequence who was later diagnosed with a metabolic disorder HMG CoA Lyase deficiency and duplication of short arm of chromosome 17. This baby had a very difficult airway to manage and requiring NPA to maintain saturations in normal range. Association of Pierre Robin Sequence with HMG CoA lyase deficiency has not been reported before. Hence our case demonstrates a rare association and prompts to suspect metabolic disorder early on in the babies with Pierre Robin Sequence.

**Keywords:** *Pierre Robin Sequence; HMG CoA Lyase Deficiency; Chromosome 17*

### **Introduction**

We describe a term, baby girl with Pierre Robin Sequence with associated HMG CoA Lyase deficiency and duplication of short arm of chromosome 17.

Pierre Robin Sequence (PRS) is named after a French physician who identified the main features of the condition in the early 20<sup>th</sup> Century [1].

### **Case Report**

Term baby girl, born by vaginal delivery at 37+1 weeks of gestation. Mum was induced for polyhydramnios and no other significant antenatal history. Following delivery baby cried but developed significant respiratory distress and failed to pick up target saturation levels. Micrognathia and cleft palate was picked up soon and given a trial of adjunct airways in the form of Guedel and Nasopharyngeal airway (NPA) to help maintain saturation levels in the normal range. Intubation attempted following failure of above techniques but not successful. Hence NPA repassed and baby transferred to Special care baby unit with continuous jaw thrust and 100% FiO<sub>2</sub> with PEEP of 6 cm over NPA. Due to high oxygen requirement, baby was intubated and ventilated. She remained ventilated for 19 days in total followed by CPAP for 6 days. Her airway was difficult to manage and required ENT input during intubation. Micro-laryngo-bronchoscopy showed posterior tongue base, cleft palate, normal vocal cord movements, left vocal cord small granuloma, normal sub-glottis and trachea.

Metabolic screen was performed on day 6 of life due to high lactate (4.8) and persistent metabolic acidosis (pH 7.13 - 7.31), which showed a very low free carnitine and acyl carnitine, normal ammonia, and urine organic acids showed a pattern suggestive of HMG CoA Lyase deficiency. CGH microarray showed a female result, with 395 kb duplication of short arm of chromosome 17 at band 17p13.2. The significance of this result is unclear.

She also had an accidental finding of bilateral retinal haemorrhages possibly related to birth injury and 2 small muscular VSDs.

Baby is currently doing well with the NPA in situ, NG feeding, regularly followed up by appropriate teams and waiting for correction surgery.

### Discussion

PRS is a condition present at birth, in which the infant has a micrognathia, glossoptosis and cleft palate [2,3]. This combination of features can lead to difficulty breathing and problems with feeding early in life [3].

The exact causes of PRS are unknown [2]. The most widely held view is that multiple contributing factors lead to a sequence of physical changes within the oral cavity. These changes are thought to occur in a series of steps, rather than as isolated events. Specifically, it is believed that failure of the lower jaw to fully develop early in gestation causes the tongue to be positioned toward the back and high up in the mouth cavity, which, in turn, prevents palate closure [4].

PRS as a condition can occur by itself ('isolated PRS') or as a feature in multiple anomaly disorders ('syndromic PRS') [4]. In about 20 to 40 percent of cases, the condition occurs alone [3]. Mutations in the DNA near the *SOX9* gene are the most common genetic cause of isolated cases of Pierre Robin sequence [3].

Other related syndromes and conditions associated with PRS include Stickler syndrome, velocardiofacial syndrome (22q 11.2 deletion), Treacher Collins Syndrome, chromosome 11, partial trisomy 11q; trisomy 18 syndrome; cerebro-costo-mandibular syndrome; Catel Manzke syndrome; campomelic dysplasia; Moebius syndrome; and CHARGE syndrome [4].

PRS can be diagnosed antenatally or detected at birth on physical examination or by genetic testing to identify DNA mutations near *SOX9* gene.

Treatment of PRS is multidisciplinary, airway management being the most critical part. Corrective surgery for cleft palate can be done at 12 - 18 months of age [4].

### Conclusion

Our baby had a very difficult airway requiring NPA, also had an associated metabolic disorder HMG CoA Lyase deficiency and duplication of short arm of Chromosome 17. Our case demonstrates a rare association and prompts to suspect metabolic disorder early on in the babies with Pierre Robin Sequence.

### Bibliography

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