

Case Report**The Successful Resuscitation in a Neonate with Down Syndrome after 45 minutes: A Case Report**Mahin Seyedhejazi¹, Maryam Haghghat Azari², Nasrin Taghizadieh³, Haleh Farzin^{2*}¹Department of anesthesiology, Full professor of pediatric anesthesiology, Pediatrics teaching Hospital, Tabriz University of medical sciences, Iran²Department of anesthesiology, Assistant of Anesthesiology, Pediatrics teaching Hospital, Tabriz University of medical sciences, Iran³Department of anesthesiology, Medical student, Pediatrics teaching Hospital, Tabriz University of Medical sciences, Iran**Corresponding Author:** Haleh Farzin, E-mail: farzin.haleh@gmail.com**ARTICLE INFO***Article history*

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Key words:Neonate,
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Down Syndrome**ABSTRACT**

Introduction: Patients with Down syndrome (DS due to relative macroglossia and dynamic airway collapse) are vulnerable to significant upper airway complications. Obstructive sleep apnea (OSA) is a common condition and noted in about 79% of these children. Children with OSA, with or without DS, are sensitive to respiratory depression by drugs such as sedatives, opioids and hypnotics. Abnormalities of the cardiovascular system are also common in Down syndrome. **Case Report:** A nine_ day old male preterm newborn with DS (e.g. gestational age of 35 weeks) was brought to operation room (OR) for insertion of central venous line and surgery of duodenal atresia. During transportation to NICU, in OR he arrested and then after 45 minutes resuscitation, he returned to life. **Conclusion:** The placement of CVL could precipitate triggers of cardiac arrest, particularly in preterm newborn.

INTRODUCTION

Down syndrome(DS) is one of most prevalent congenital abnormalities(1).It is most obviously that outcome is poor in resuscitation cases due to cardiac or cardiorespiratory arrest, and is associated with 87% to 89% mortality rate or severe morbidity(2). Children with heart disease in comparison with patients without heart disease may be sicker in the time of occurrence of anesthesia – related cardiac events and they experience higher mortality rate. These types of arrests are frequently reported from general operation room and it has probably originated from cardiovascular reasons (3). In one study, mortality was particularly as high as 56% in duodenal stenosis DS patients. Associated congenital heart disease especially endocardia cushion defects and high prevalence of pneumonia are contributor factors in this remarkable mortality rate(4).Obstruction of upper airway in children with Down syndrome is frequently a complex course with various causes and symptoms of residual airway obstruction are common in postoperative period(5). Although, due to medical improvements in multidisciplinary cares, the median survival rate of patients with DS has evolved (1). Unfortunately,

there is no comprehensive reports about incidence of all important unpleasant events such as bradycardia during induction of anesthesia, obstruction of natural airway and croup in post-intubation or-instrumentation period, even in children with DS (no cardiac case), it seems to be high in comparison with remain of children (2, 6).

Case Presentation

We present a nine- day old the preterm and premature male. DS with gestational age of 35 weeks, who was brought to operation room for insertion of central venous line and surgery due to duodenal atresia. His weight was 2400 grams. He was icteric, and has symptoms of atrial septum defect (ASD) in echocardiography. The surgery was performed within an hour without any problem and the vital signs were stable during operation 55 minutes after finishing the surgery while was waiting for NICU staff in to transportation .During transferring the neonate to NICU, suddenly some changes appeared in electrocardiogram (ECG) such as tall T waves and bradycardia (HR=87 beat/min) and then

converted to ventricular tachycardia (VT). Immediately, the patient was returned to OR and we began CPR. Up to 35 min, the CPR was not successful. Synchronized cardioversion was applied for 4 times (5-15 J). One dose of intracardiac epinephrine (1/10000, 2ml) was injected and central vein

catheter was pulled out about 1 cm. The CPR was continued all the time without interruption (with chest compression and epinephrine injection). After 45 min attempt, the CPR was successful, the rhythm became normal (HR=163 beat/min, BP=71/49 mmHg and Sao2 = 96%) and then he was

Author dute	Year of study	N	clinical finding
Asif PADIYATH (7)	Patients from 1 day up to 18 years admitted to an intensive care unit (ICU) during their stay at a PHIS-participating hospital from January 2004 through December 2014 were included.	849,250 patients from 44 centers	* In children with and without Down Syndrome vary substantially. The incidence of cardiac arrest was high in Children of Down Syndrome with accompanying cardiac anomalies, as compared to children without Down Syndrome. Despite having a higher likelihood of cardiac arrest, the risk of mortality is lower in DS children. Additional efforts are required to determine what specific patient characteristics might account for higher incidence of cardiac arrest in children with DS.
Christoph Ellenberger (8)	January 2002, and December 2013	From a 1'543 patients, 920 were treated with ITMA and 623 with IVA.	The results of this study suggest that, a small dose of spinal morphine with minimizing systemic opioid administration improving postoperative pain control and may reduce the incidence of PPCs in patients undergoing elective cardiac surgery. These findings warrant a multicenter randomized trial to demonstrate the effectiveness of this simple and safe intervention, particularly in patients at high-risk of PPCs
Kentaro Nogami (9)	2016	N=1 14-year-male	this study postulated that in DS patients asystole was triggered by a dysfunction in the autonomic cardiac regulation and sympathetic activation, due to the use of high concentrations of sevoflurane. In future cases of pediatric patients with Down syndrome, with or without heart disease, the concentration of sevoflurane should be increased gradually, and intravenous catheter should be promptly inserted to administer anticholinergic drugs as quickly as possible in order to prevent transient arrhythmia and cardiac arrest.
Antonio Rodríguez-Núñez (10)	2014	Nineteen DS patient (15–30 year old) and 20 University level subjects (18–29 year old)	After short instruction based on a brief video and hands-on session DS young people with mild or moderate intellectual disability and without physical disability were able to deliver CC but could not achieve good CC quality.
David Cha (11)	2018	N=1 24 year male	Patients with DS rarely suffer from coronary artery disease. In this case, the author believe that patient's residual right ventricular dysfunction from a previous large ventricular septal defect partially contributed to the complications. The findings in previous study describe sevoflurane's role in possibly inducing cardiac arrest due to autonomic dysfunction. Due to low cardiopulmonary reserves in DS, they are at higher risk of complications compare to the normal patient population. The patients with DS that have existing or repaired structural anomaly, perioperative assessment and vigilant monitoring may help to reduce cardiopulmonary complications.

transferred to NICU. The patient was intubated with endotracheal tube No 3 and he was not awake during transfer to NICU. He was stable in NICU and was extubated 2 days after the CPR and transferred to the neonatal ward.

CONCLUSION

The placement of central venous line may be the reason. Therefore, neonates with congenital anomalies specially ones with cardiac problems are vulnerable to even mild stimulations by internal device and inter-cardiac instrumental, for example, clv.

Financial Disclosures

The authors declared they had no financial disclosure. We obtain informed consent of parents. The authors declare that they have no conflicts of interests..

Learning Points

- 1 Please be patient during resuscitation of children, do not give up CPR early
- 2 INTRACARDIAC epinephrine may be last choice in CPR and rescue the child
- 3 Please check central venous catheter site as soon as possible in infants and children.
- 4 There are no population-level data on the incidence of acquired major cardiovascular ,cerebrovascular complications in children with DS, and no data examining how risk factors or cardiovascular comorbidities in DS might impact on cardiovascular event incidence. The data of this paper may be also valuable to inform health care planning for children with DS.

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