

**POSTOPERATIVE NEUROLOGICAL
COMPLICATIONS FOLLOWING ON-PUMP
BIDIRECTIONAL GLENN SHUNT, VERSUS
OFF-PUMP GLENN SHUNT WITH CAVO-
ATRIAL TEMPORARY SHUNT, EARLY
POSTOPERATIVE RESULTS.**

Thesis

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Surgery*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾

سورة البقرة

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Abstract

As there is a higher rate of survival after Congenital heart surgery, there is a growing concern about quality of life. Neurological dysfunction is a significant problem after congenital heart surgery that may affect quality of life. Also due to better surgical outcome & higher survival rate, the focus is increasingly on the late neurodevelopmental and behavioral problems associated with pediatric cardiac surgery.

Objective: Bidirectional Glenn shunt is a well-established procedure performed as a part of the single ventricle palliation pathway. Whether the bidirectional Glenn shunt is better performed without the support of cardiopulmonary bypass, is still a matter of debate. In this study, we report & Compare early post operative neurological outcome after on pump and off pump Bidirectional Glenn shunt with temporary cavo-atrial shunt.

Methods: between July 2012 & Feb. 2014 , 50 Patients indicated for Glenn shunt were divided into two groups. Group I (25 patients) where It was done with cardiopulmonary, and Group II (25 patients) where it was done without cardiopulmonary Bypass and with Cavo-atrial shunt. In our study, the Mean \pm SD age of the patients was (36.26 \pm 19.149 Month), in the range of 15 months and 86 month. Preoperative evaluation to select patients according to exclusion and inclusion criteria, documenting different variables. Intraoperative and postoperative monitoring documenting different variables of CVP, O₂ Sat., Operative time , shunt time, bypass time, HCT , S.Creat., Also neurological evaluation using Modified Glasgow Coma Scale for Infants and Children .

Results: There was insignificant difference between both groups regarding preoperative variables and postoperative neurological outcome.

Conclusion: Bidirectional Glenn Shunt may be done on pump or offpump with cavo-atrial temporary shunt with insignificant difference in the early postoperative neurological outcome, but we report that late complications and neurodevelopmental abnormalities should be traced in other longterm studies. we also want to focus on better techniques of intraoperative monitoring, As Near-infrared spectrography, transcranial Doppler, should be adopted as standard of care ,as it was not available during our study.

Key words:

Bi-directional cardiopulmonary shunt, off-pump, Neurological Complications.

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List of Abbreviations

BDG	Bidirectional Glenn
CPB	Cardiopulmonary bypass
CT	Computed tomography
DHCA	Deep hypothermic cardiac arrest
DORV	Double outlet right ventricle
EEG	Electro-encephal gram
FIQ	Full-scale IQ
HLHS	Hypo plastic left heart syndrome
IVC	Inferior Vena Cava
LPA	Left Pulmonary Artery
NIRS	Near infra red spectrography
R.A.	Right Atrium
RPA	Right Pulmonary Artery
RCT	Randomized controlled trial
SIRS	Systemic inflammatory response
SVC	Superior vena cava
TCD	Trans-cranial Doppler
TCPC	Total cavopulmonary connection
TGA	Transposition of the great vessels
UVH	Univentricular heart
VIQ	Verbal IQ

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INTRODUCTION

Because of increased survival rate, the focus in congenital heart surgery is increasingly on quality of life. Discussing the issue of quality of life of children receiving cardiac surgery early in life, we found that neurological complications are the most important aspect that may affect them due to many reasons.

Patients with univentricular heart remain at increased risk of neurodevelopmental sequelae caused by several brain mechanisms. Hypoplastic left heart syndrome is associated with the poorest outcome. Because of developments in surgical methods and preoperative and postoperative care, recent results are better than those of the first reports.

AIM OF WORK

Bidirectional Glenn shunt is a well-established procedure performed as a part of the single ventricle palliation pathway. Whether the bidirectional Glenn shunt is better performed without the support of cardiopulmonary bypass, is still a matter of debate. In this study, we report & Compare early post operative neurological outcome after on pump and off pump Bidirectional Glenn shunt with temporary cavo-atrial shunt.



HISTORICAL BACKGROUND OF **UNIVENTRICULAR REPAIR**

Ever since the masterful description of the circulation by William Harvey, the importance of the right ventricular function has always been debated. From the early 1940s, numerous experiments were performed to determine whether the pumping action of the right ventricle is necessary to maintain a normal circulation. ⁽¹⁾

As early as 1942, Starr and his colleagues concluded that extensive cauterization of the canine right ventricle caused only minimal increase in peripheral systemic venous pressure. In addition, **Bakos (1950)** demonstrated that there was no fall in pulmonary arterial pressure. ⁽²⁾

Right ventricular exclusion was successfully achieved by **Rodbard and Wagner in 1949**, which ligated the main pulmonary artery and anastomosed the right atrial appendage to the pulmonary artery. The right ventricle, however, was still thought to contribute to the pulmonary circulation because of functional tricuspid regurgitation. Several other experimental studies confirmed the feasibility of right ventricular exclusion when the right atrium had been prepared to sustain an additional workload. ⁽³⁾