CORPUS PUBLISHERS

Corpus Journal of Case Reports (CJCR)

Volume 3 Issue 2, 2022

Article Information

Received date : June 04, 2022

Published date: June 14, 2022

*Corresponding author

Cornara Stefano, Ospedale San Paolo, Via Genova 3017100, Savona, Italy. Phone: +390198404709.

Keywords

Transesophageal Echocardiography; Anesthesia; Ischemic Stroke; Acetylsalicylic Acid; Echocardiographists

Case Series

Percutaneous Closure of Patent Foramen Ovale Performed Under Hypnosis: A Case Series

Cordone Stefano[1], Bacino Luca[1], Buscaglia Elisa[1], Ghione Matteo[1], Somaschini Alberto[1], Cornara Stefano[1*], Matteo Astuti[1], Pentimalli Francesco[1], Broda Marta[2], Botta Marco[1], Marin Paolo[2], Bellone Pietro[1]

[1]Cardiologia, Ospedale San Paolo, Savona, Italy

[2]Anestesia e Rianimazione, Ospedale San Paolo, Savona, Italy

Introduction

The presence of a Patent Foramen Ovale (PFO) could be one of the leading causes of left circulation thromboembolism. Recent studies confirmed that in selected subset of patients with embolic stroke of undetermined source, PFO closure could reduce the risk of new ischemic events on top of medical therapy [1,2].

Percutaneous closure of PFO is a procedure commonly performed in almost all cath-lab. The most used techniques is performed through femoral venous access and under guidance of Transesophageal Echocardiography (TEE). Pharmacological deep sedation and often general anesthesia with oro-tracheal intubation are necessary to allow a safe procedure with a continuous TEE guide. General anesthesia or deep sedation are not completely free from complications.

Over the last years, the clinical use of hypnosis for analgesic and sedative purposes has showed important benefits [3].

Cases

In this Article, we would like to present a case series of six patients which underwent PFO percutaneous closure admitted at the Emergency Department from October 2020 and November 2021.

A cerebral Magnetic Resonance Imaging was performed in all patients and all showed an ischemic lesions. The neurologist confirmed the diagnosis of ischemic stroke. In all patients a weekly Holter electrocardiography monitoring excluded cardio-embolic arrhythmias such as atrial fibrillation. Transcranial Doppler detected the presence of a right to left shunt. Transesophageal Echocardiogram (TEE) confirmed the presence of a Patent Foramen Ovale (PFO) in all patients and an atrial septal aneurysm was documented in four of them. Multidisciplinary team evaluation judged the PFO as the most likely cause of recurrent ischemia; thus, the indication to PFO percutaneous closure was given. The possibility of hypnotic analgo-sedation was offered to and accepted by the patient. Patients were prospectively assigned to Group A and Group B in a sequential, prospective 1:1 ratio. No pre-procedural tests were used to identify patients more suitable for hypnosis. In Group A patient were treated with hypnotic induction and analgo-sedation if necessary and Group B treated with analgo-sedation only. A multidisciplinary team of interventional cardiologists, echocardiographists and anesthesiologists performed the intervention. Hypnotic status was induced by a cardiologist with certified and experienced hypnology education. Fluoroscopic guidance was used together with TEE monitoring. In all patients an Amplatzer PFO Occluder St.Jude-Abbott was delivered through percutaneous right femoral approach . Before the procedure, the patients qualified their pain and anxiety status using the pain and anxiety scales (figure 1). The hypnologist induced hypnotic status using internal focusing technique. Firstly, the patients focused attention on our breath; the hypnologist then gave to the patient's suggestions aiming to lower critical thinking and leading mind toward a pleasant situation. At the end of induction total muscle relaxation was obtained. Hypnotic conditioning allowed the patients to lose attention towards the TEE probe and to tolerate all the procedure. Local xylocaine was injected in the groin region to allow percutaneous right femoral venous approach.

In all Group A patients, no other local or systemic anesthetic or sedative drug had been administered throughout the procedure. In Group B conventional anesthetic drugs according to our anesthetic protocol was used (Table 1). With regards to antithrombotic and anti-platelets therapy, intravenous heparin (100 UI/kg) was administered during the procedure and acetylsalicylic acid (100 mg) and Clopidogrel 75 mg were administered with the indication to be continued for six months according to our local protocol. At the end of the procedure the patients qualified their pain localized in the femoral region and their anxiety on the respective scales (figure 2). The anxiety state of pre-treatment period was similar in two groups, and obviously reduced in post-treatment phase, but the patients induced with hypnotic state had a more significant reduction of the anxiety state and pain compared to control Group. The following day, all patients induced with hypnotic state reported a pleasant memory of the procedure.

Table 1: Anesthetic drugs used during the procedural in Group A (hypnosis), and Group B (analgo-sedation).

Drug Somministration	Group A	Group B
Midazolam (mg)	0	8,3 ± 2,8
Fentanyl (mg)	0	0,1
Propofol (mg)	0	253 ± 26

Conclusion

To the best of our knowledge, this is the first case series of PFO closure under hypnotic analgo-sedation. This approach appears promising as it can lead to a more positive experience for the patient and it is considered as an adjunctive analgo-sedation technique which could reduce the use of conventional drugs.

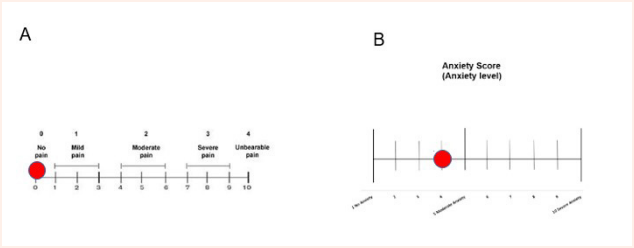

Figure 1: Pain and anxiety levels qualified before the procedure on the pain and anxiety scales.

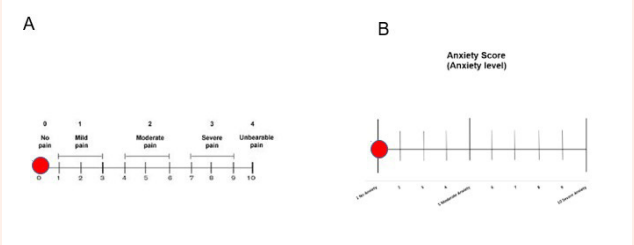

Figure 2: Pain and anxiety levels qualified at the end of the procedure on the pain and anxiety scales

Authors' contribution:

Cordone Stefano: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Bacino Luca: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Buscaglia Elisa: She contributed to the conception of the work, drafting the work and revising it, she approved the final version and she agrees for all aspects of the work.

Ghione Matteo: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Somaschini Alberto: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Cornara Stefano: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Matteo Astuti: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Pentimalli Francesco: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Broda Marta: She contributed to the conception of the work, drafting the work and revising it, she approved the final version and she agrees for all aspects of the work.

Botta Marco: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Marin Paolo: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Bellone Pietro: He contributed to the conception of the work, drafting the work and revising it, he approved the final version and he agrees for all aspects of the work.

Declarations

All authors read and approved the final version of the manuscript.

All authors have not any relationship with industry or other relevant entities-financial.

All authors not received any grant or source of funding for the submitted article.

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