



Case Report

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## Vagal Nerve Stimulation (VNS) for Depression and Uncontrolled Seizures: Report of a Case.

Dr R Ramnarayan\*, Dr H. Simon<sup>1</sup>,

1. Dr H. Simon MS, MCh. FRCS. (Late), Consultant Neurosurgeon, New Hope Hospital 814, PH Road Kilpauk, Chennai -600010

**Corresponding Author: Dr R Ramnarayan.** MCh. FRCS, IFAANS. Consultant Neurosurgeon, New Hope Hospital 814, PH Road, Kilpauk, Chennai -600010.

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### **Abstract**

*Vagal nerve stimulation as a treatment for both uncontrolled seizures and depression has been approved a long time back. But studies in India are not that common. Here we describe an adult male with very long-standing uncontrolled seizures and who later developed severe aggressive behavior and depression. He underwent vagal nerve stimulation and at six months has improved very well. He has now discontinued four out of seven anticonvulsant drugs and stopped all three antidepressants he was on.*

**Keywords:** *Vagal nerve, stimulation, depression seizures, results.*

## Introduction

Stimulation of the vagal nerve has been approved as a treatment for refractory epilepsy and treatment-resistant depression [1]. We describe a case of refractory epilepsy of many decades that developed resistant depression and underwent VNS with very good results.

## Case Report

A 60-year-old man with a history of seizures diagnosed at the age of 8 years came to our clinic. He has been on treatment for the same from that time. However, the seizures were uncontrolled and he was added on more drugs over the last few decades. His family claimed he was very regular in medications but still used to get two or three seizures every month. The family complained that for the last decade or so he was having aggressive behavior with episodes of violence and abusive activity. Because of this his wife and children left him. From that time he was slowly becoming depressed and had tried committing suicide at least 10 times in the last two years. He was on three anti-depressant medications. Clinical examination showed him to be conscious cooperative with no lateralizing deficits. The neuropsychological assessment showed a good level of intelligence with average memory. The Beck Depression index was 35/40. As he was having both uncontrolled seizures and depression a VNS surgery was chosen as the best treatment option. He underwent left VNS insertion and the post-operative period was uneventful.

Now at six months follow up, his aggression score has become 3 out of 40 and Beck depression score has now become 12. The patient feels better and more independent. He has now totally stopped all three antidepressants and three out of seven anticonvulsants he was on and the rest are being tapered. In the last six months, he just had three episodes of GTCS that too in the initial months of adjusting the drugs.

## Discussion

The first VNS was done by Penry et al in 1988. This was subsequently approved by FDA as an adjunctive treatment for refractory epilepsy in 1997 [1] and for severe depression in July of 2005 [2]. VNS implantation is usually done on the left side to avoid cardiac complications. The mechanism of action is not still understood fully. Boylan et al [3] reported that up to 63% of patients with resistant epilepsy had undiagnosed depression. Moreover, antiepileptic medications can cause depression. Morace et al [4] looked at 32 patients with drug-resistant epilepsy who underwent VNS and followed up upto 9 years. Twelve patients out of 29 who followed up were responders. They confirmed that VNS is a safe procedure and a valid palliative treatment option for drug-resistant epileptic patients not suitable for resective surgery. Mohr and others [5] reviewed the available clinical evidence and neurobiology of VNS in

treatment-resistant depression. Four clinical trials with 355 patients were examined. VNS demonstrated steadily increasing improvement with full benefit after 6-12 months, sustained up to 2 years. Patients who responded best had a low-to-moderate antidepressant resistance. Aaronson et al [6] compared whether adjunctive VNS with treatment as usual in depression has superior long-term outcomes. This 5-year, prospective, open-label, nonrandomized, observational registry study included 795 patients experiencing a major depressive episode of at least 2 years' duration with multiple treatment failures. The results indicated that the adjunctive VNS group had better clinical outcomes than the treatment-as-usual group, including a significantly higher 5-year cumulative response rate and a significantly higher remission rate. Also, the VNS arm showed a greater reduction in the suicidality profile compared with the treatment-as-usual arm.

In our study also the patient has a significant reduction in the depression score and a good number of anticonvulsants have been reduced. The patient says his quality of life has improved significantly.



**Figure 1** postoperative X-ray showing the vagal nerve stimulator in position.

	Preoperative status	At six months
MOAS	Verbal aggression – 3 Aggression against Property - 4 Autoaggression - 3 Physical Aggression – 8 Total 18/40	Verbal aggression – 1 Aggression against Property - 2 Autoaggression - 1 Physical Aggression – 1 Total 5/40
Beck Depression score	35/40	12/40
AED”s	7 drugs some multiple totaling 18 tablets daily	3 drugs some multiple totaling 8 tablets daily
Antidepressants	3 drugs one twice daily totaling 4 tablets daily	All stopped now.

**Table 1**

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