

Experience with electrocauterization of the anterior ethmoidal nerve for vasomotor rhinitis.

Li Yong MD

Visiting Surgeon

Department of Otorhinolaryngology, Muhimbili Medical Centre, Dar es Salaam, Tanzania

Key Words: Vasomotor rhinitis; anterior ethmoidal nerve, electrocauterization.

Intranasal electrocauterization of the anterior ethmoidal nerve (AEN) was carried out on 26 patients with vasomotor rhinitis (VMR). The patients were followed up for a period of 15 months. The symptoms were controlled in 84% of the cases although they were apt to recur in the long term. The procedure is simple, effective and devoid of complications. It is recommended for patients with VMR who do not respond to drugs or other conservative treatment.

Introduction

Vasomotor rhinitis is a disease caused by the dysfunction of the autonomic nerves in the nasal mucosa. The clinical manifestations of this disease are paroxysmal sneezing, nasal obstruction and massive rhinorrhoea. These symptoms are triggered by emotional fluctuations, fatigue, endocrine disorders and weather changes. The patients with VMR are not allergic on skin testing or by other diagnostic tests.

VMR is probably due to nonspecific hyperexcitability of the parasympathetic nerve fibres in the nose. It was on this basis that Golding Wood in 1960¹ first did a vidian neurectomy for patients with VMR. This procedure was later adopted by other surgeons but eventually abandoned because of high recurrence rates of the VMR symptoms². Fan Zhang³ performed greater superficial petrosal neurectomy for the treatment of VMR. Although he obtained satisfactory results in symptom control, this procedure is complicated and therefore fell out of favour.

On the basis of the distribution of the intranasal parasympathetic fibres of the AEN and the seromucinous glands⁴ the intranasal anterior branch of the AEN was cauterised to treat patients with vasomotor rhinitis.

Materials and methods

The patients in this study included 26 adults aged between 17 and 47 years (mean 28 years), there were 8 males and 28 females (sex ration M:F; 1:3.5). The patients had symptoms for from 2 months to 13 years. All of them were tested for allergy and found negative. Three had recurrence of VMR

Address for Correspondence to: Dr Li Yong MD, Department of Otorhinolaryngology, Shang-Tong Overseas Chinese Federation Hospital, Zibe City, Shang-Tong Province, P R China. 255000.

following a previous vidian neurectomy. The rest had been on medical and other conservative treatment without relief. The patients were divided into groups according to the severity of the symptoms using a point score as follows:

TABLE I Point score table of symptoms

Points	Sneezing	Points	Rhinorrhoea	Points	Nasal Obstruction
1	1-2 times/week 2-4 times/episode	0	Nil	0	Nil
2	1-2 times/day 2-4 times/episode	1	Slight	1	Slight (occasional)
3	>2 times/day >5 times/episode	2	Moderate	2	Moderate (alternate nostril)
4	>5 times/day >10 times/episode	3	Severe	3	Severe (continuous)

Procedure

With the patient seated, local anaesthetic was administered by packing the nose with pieces of cotton wool soaked in 1% tetracaine and with 1% ephedrine. After 5 to 10 minutes, the pack was removed. Under direct vision the tip of the electrocautery was pressed on the mucosa of the anterior part of the septum just opposite the agger nasi for three seconds. This was done on one side. The same procedure may be repeated on the opposite side after a period of one week if necessary. Following electrocauterization, ephedrine nasal drops were prescribed for a week. Any exudate in the nose was removed a day after the electrocauterization procedure.

The patients were followed up and the symptom scores entered on the data sheet. The criteria used for assessing the results are as follows:

Obvious effectiveness **6 points reduction over initial score**

Moderate effectiveness 3 points reduction
No effect 1 point reduction

Results

Table II analyses the results according to the follow-up period interval and symptoms score.

Accordingly the effect of the procedure was maximal during the first month following the procedure and gradually decreased to 60% after 12 months follow-up.

TABLE II Results of electrocauterization of anterior ethmoidal nerve.

Time interval (months)	Patients	Result			Effectiveness rate
		No effect	Moderate	Obvious	
1	26	4	10	12	86.6% (22/26)
2	25	4	11	10	84.0% (21/25)
3	23	5	8	11	78.2% (19/23)
6	24	6	8	10	75.0% (18/24)
9	23	7	7	9	69.0% (16/23)
12	20	8	5	7	60.0% (12/20)
16	22	8	6	8	63.0% (14/22)

Twelve patients developed homolateral nasal obstruction due to crusting of the exudate but no sneezing or rhinorrhoea was noted. In seven patients the contralateral side was cauterised because of recurrence of the symptoms after one week. In these patients there was immediate improvement of the sneezing and rhinorrhoea symptoms and the nasal obstruction gradually improved over a period of two weeks following the procedure. One patient had recurrence of symptoms after three months, one after six months and two after one year. There was no recurrence noted among the patients who had prior vidian neurectomy.

All the patients tolerated the procedure well and in none were serious complications noted. Bleeding

from the anterior ethmoidal artery area was noted in two patients during the procedure. In these patients the bleeding was controlled by anterior nasal packing for 24 hours. In one patient a mucosal ulcer was noted at the site of the electrocauterization. This healed within two weeks.

Discussion

Three sources of parasympathetic nerve fibres to the nasal mucosa include the vidian nerve, intranasal autonomic microganglia⁴ and the trigeminal nerve. Nomura⁵ and Sun Su Yan⁶ have demonstrated that the AEN contains parasympathetic nerve fibres which originate from the ciliary ganglion within the orbit and these are involved in the sneezing reflex arc. The distribution of the AEN is to the anterior ethmoidal air cells and the anterior part of the nasal cavity in which seromucinous glands are profuse. This is also the most sensitive area (agger nasi). On this basis, it is possible to improve the symptoms of VMR by carrying out anterior ethmoidal neurectomy. In this study the short-term results following electrocauterization show 84% effectiveness in the control of symptoms and are similar to those reported by Dong Zhang⁷.

The high recurrence rates of VMR following vidian neurectomy² can be explained by the multiple sources of parasympathetic nerve fibres to the nasal cavity. This is attested by the excellent results obtained following the electrocauterization procedure in the three patients on whom vidian neurectomy had been done.

Our results show 30% recurrence. This rate is lower than that obtained by Tong Zhong⁸ who indicated that the recurrence rate was similar to that following vidian neurectomy. Corote⁹ found out that in the long term, there was regeneration and re-innervation of the parasympathetic fibres to the nasal mucosa after vidian neurectomy. This phenomenon could

as well be true in patients on whom anterior ethmoidal nerve electrocoagulation has been carried out and hence the gradual recurrence of VMR symptoms as shown in this study.

As in vidian neurectomy, unilateral electrocoagulation of the anterior ethmoidal nerve had its effect on both sides of the nose. Hiranandani¹⁰ and Golding-Wood¹ explained this phenomenon on the basis of a neural arc which existed in both nasal cavities.

The complications, which included nasal bleeding and mucosal ulceration, are best avoided by proper control of the depth of cauterisation on the nasal mucosa.

In conclusion, inferior ethmoidal nerve electrocauterization is simple, painless and effective in the treatment of vasomotor rhinitis (VMR). Taking the high recurrence rate of the symptoms into consideration, it is the opinion of the author that patients with VMR are best treated conservatively and electrocauterization of the anterior ethmoidal nerve done as a final resort.

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Acknowledgements

I am very appreciative of the inspiration and support from Professor B M Minja and Dr N H Moshi, the ENT Department, Muhimbili Medical Centre, Dar es Salaam.