Clinical Outcomes of Patients with Refractory Trigeminal Neuralgia: Retrospective Analysis of Patients with Failed Radiation or Surgical Therapy

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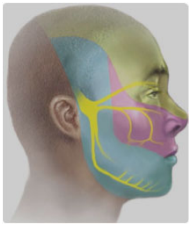
Trigeminal Neuralgia



Trigeminal neuralgia (TGN) is a painful condition characterized by sharp, paroxysmal pain in the distribution of cranial nerve five.
The distribution of TGN is more common in second and third division of trigeminal nerve.

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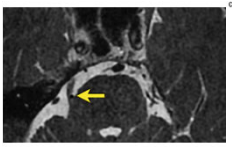
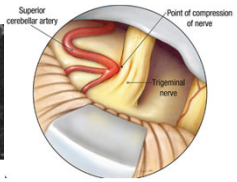
Diagnosis





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Treatments

First line therapy includes medications such as carbamazepine or other antiepileptic drugs such as pregabalin, gabapentin, or oxcarbazepine

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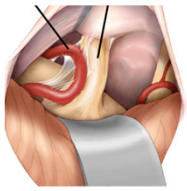
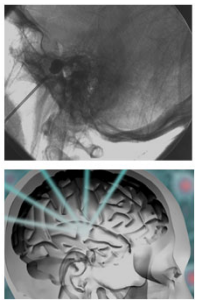
Treatments

If medications fail

- Common surgical managements are stereotactic radiosurgery (SRS), percutaneous rhizotomy, and microvascular decompression (MVD)





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Reported Outcomes

- MVD: long-term pain outcomes have generally been favorable; highly variable in the literature with success rates ranging from 50-90%
- The recurrence rate of MVD treatment was much lower than that of conventional drug treatment and gamma knife surgery.
- Reported risk factors for recurrence:
  - Younger patients
  - Poor preoperative pain control (Barrow Neurological Institute score >IV)
  - multivessel compression; Combined compression of the superior cerebellar artery and petrosal vein

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Aim and Method

- Explore risk factors associated with failure to respond or recurrence of TGN in patients who underwent either microvascular decompression (MVD) or radiosurgery followed by redo MVD.
- Single-institution retrospective review from 2016 to 2020 of patients with TGN who underwent MVD or radiosurgery and ultimately required MVD for recurrent or incompletely treated disease.
- Univariate analyses were performed using SPSS.

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Demographics

Variable	N=32
Female	21
Median Age	65.9
Median BMI	25.9
Initial treatment	
MVD	9
SRS	23
DM type II	3
Tobacco Use	4
Median duration of symptoms prior to 1st treatment (years)	3
Compressive lesion on MRI prior to 1st treatment	
Yes	13
No	17
Unknown	2
Sidedness	
Right	19
Left	13
Pain distribution	
V1	1
V2	6
V3	7
Multiple divisions	18

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Outcomes

Pain free after 1st intervention	Frequency	Percent
No	16	50
Yes	16	50
Total	32	100

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Outcomes

Pain free after 2nd intervention	Frequency	Percent
No	4	12.5
Yes	28	87.5
Total	32	100

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Outcomes

Pain free at follow up	Frequency	Percent
No	11	34.4
Yes	21	65.6
Total	32	100

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Univariate Analysis for Pain Freedom Following Initial Intervention

Variable	Univariate Analysis p-value
Gender	0.135
Age at intervention, years	0.065
BMI	0.840
DM type II	0.226
Tobacco use	0.600
Duration of symptoms prior to intervention	0.224
Pain distribution prior to intervention	0.159
Abnormality/compressive pathology on MRI	0.125
MVD as initial treatment	**0.015**
Intraoperative vascular compression	0.111

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Univariate Analysis for Pain Freedom Following Secondary MVD

Variable	Univariate Analysis p-value
Gender	0.272
Age at intervention, years	0.198
BMI	0.881
DM type II	1.00
Tobacco use	1.00
Duration of symptoms prior to initial intervention	0.432
Duration between initial and secondary intervention	0.939
Pain distribution prior to secondary intervention	0.045
Abnormality/compressive pathology on MRI	0.133*
MVD as initial treatment	0.303
Pain free interval after initial treatment	0.600
Intraoperative vascular compression	1.00
Intraoperative adhesions/scarring	0.631

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Results

Pain Free After 1st Intervention- SRS Vs MVD	MVD N = 9 (%)	SRS N = 23 (%)
No	1 (11%)	15 (65%)
Yes	8 (89%)	8 (35%)

Chi-square P= 0.015

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Results

Pain free after 1st intervention-SRS only	No vascular compression on MRI N= 13 (%)	Vascular compression found on MRI N= 10 (%)
No	11 (84.6%)	4 (40%)
Yes	2 (15.4%)	6 (60%)

Chi-square P= 0.039

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Results

		Pain free after 2nd intervention		
		No	Yes	Total
Pain free after 1st intervention	No	3	12	15
	Yes	1	7	8
	Total	4	19	23

Chi-square P= 1.0

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Conclusion

- Our single institution study suggested that MVD results in improved post-operative pain in comparison to radiosurgery for the treatment of TGN.
- We also discovered that response to the first treatment modality was not clearly predictive of response to the second treatment, with second treatment modality being MVD.

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Questions to be answered

- Our ongoing research
  - Looking at patients who underwent SRS with failure and redo SRS, factors determining response to second SRS
  - Collecting more patient data for MVD and redo MVD

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