Cluster Headache Diagnosis and Treatment

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August 20, 2015

Learning Objectives

After this lecture the participant should be able to:

- Understand all types of TACs
- Be able to accurately diagnosis Cluster Headache
- Know how to treat Cluster Headache acutely
- Be familiar with the latest preventive treatments for Cluster Headache

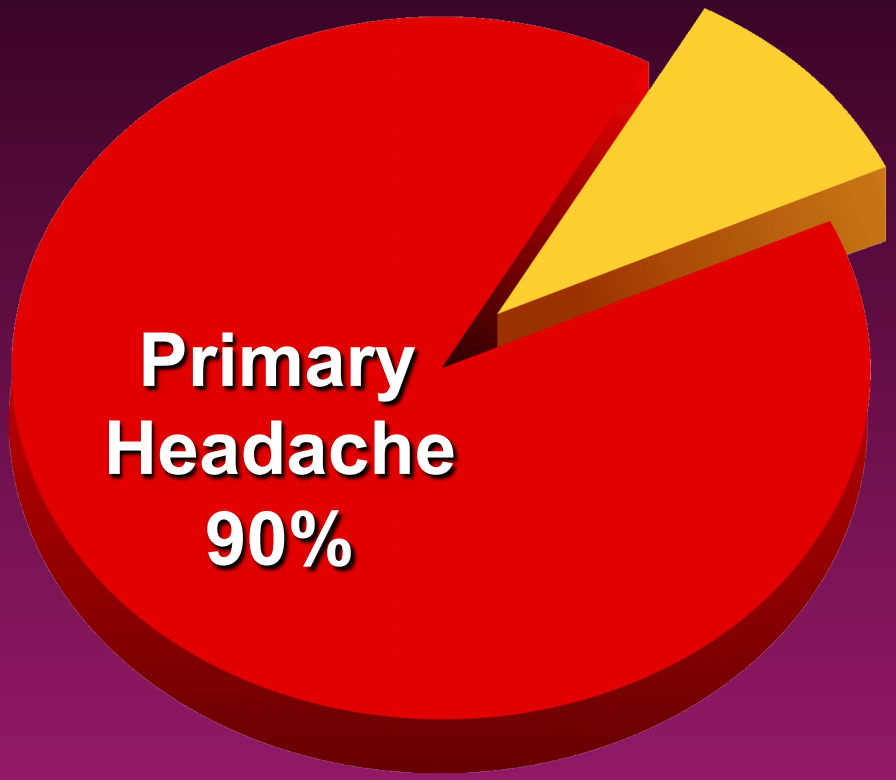
Headache Classification

Primary Headaches

- Migraine
- Tension-type
- Trigeminal Autonomic Cephalgias
  - ***Cluster headache***

Secondary Headaches

- Tumor, hemorrhage
- Meningitis, trauma
- ?Sinusitis, ? Cervical problem
- ?TMD
- Giant cell arteritis
- Other systemic disorders



ICHD -II *Cephalalgia* 2004; 24 (Suppl 1):1-160.

Short-Lasting Headaches

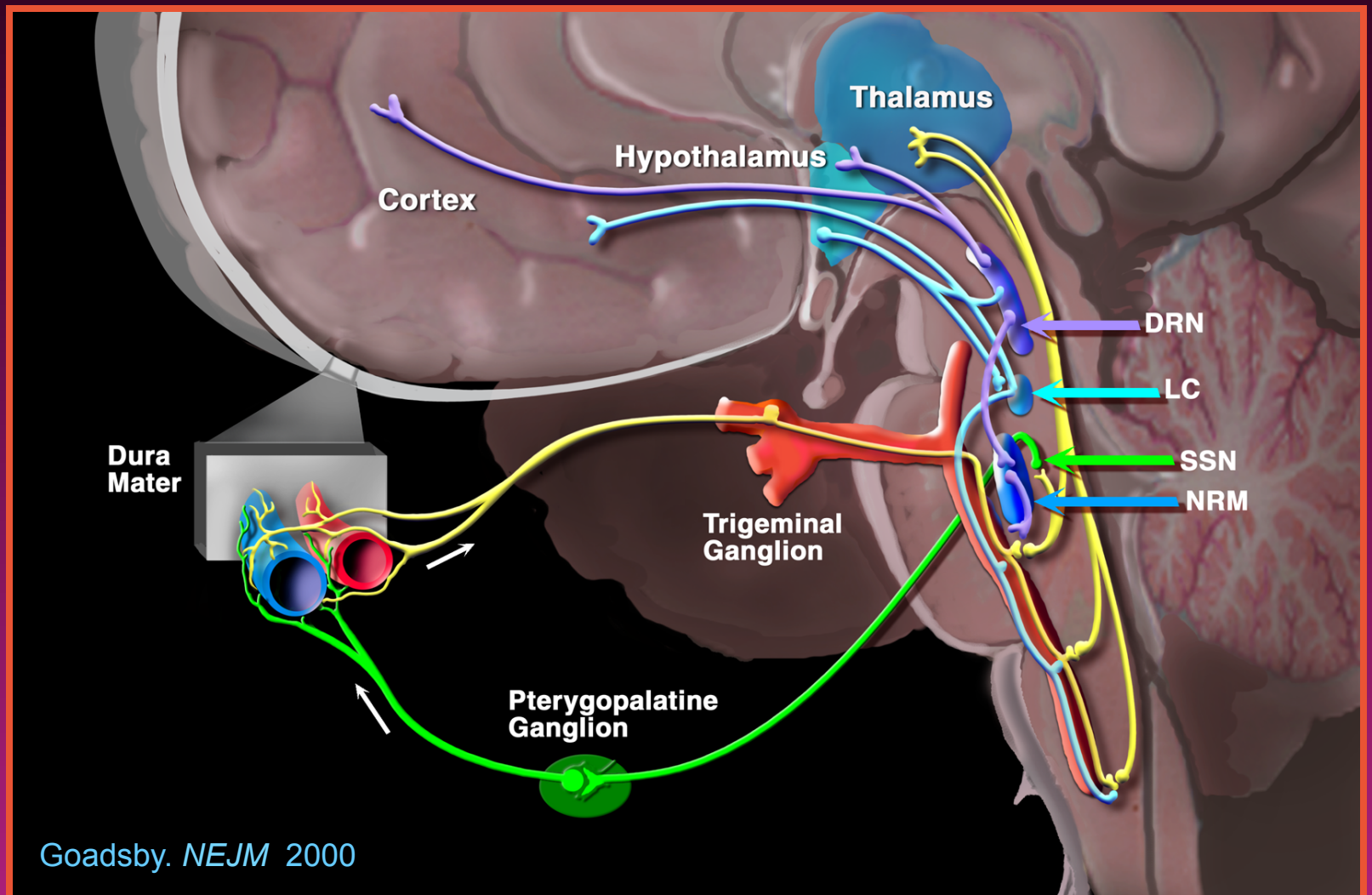
With autonomic features (TACs)

- ***Cluster***
- The paroxysmal hemicranias
- SUNCT and SUNA
- Cluster-Tic
- CPH-Tic
- (Hemicrania Continua) (Exacerbations are short-lasting with autonomic features)

Cluster Headache Epidemiology

- Rare disorder affecting approximately 0.09 – 0.4% of the US population
- Sex ratio (M:F) (Manzoni, *Cephalalgia* 1998)
  - Prior to 1960 6.2:1
  - 1980-1987 3.0:1
  - 1990-1995 2.1:1
  - ICHD-II 3-4:1

The Trigeminovascular System of Moskowitz

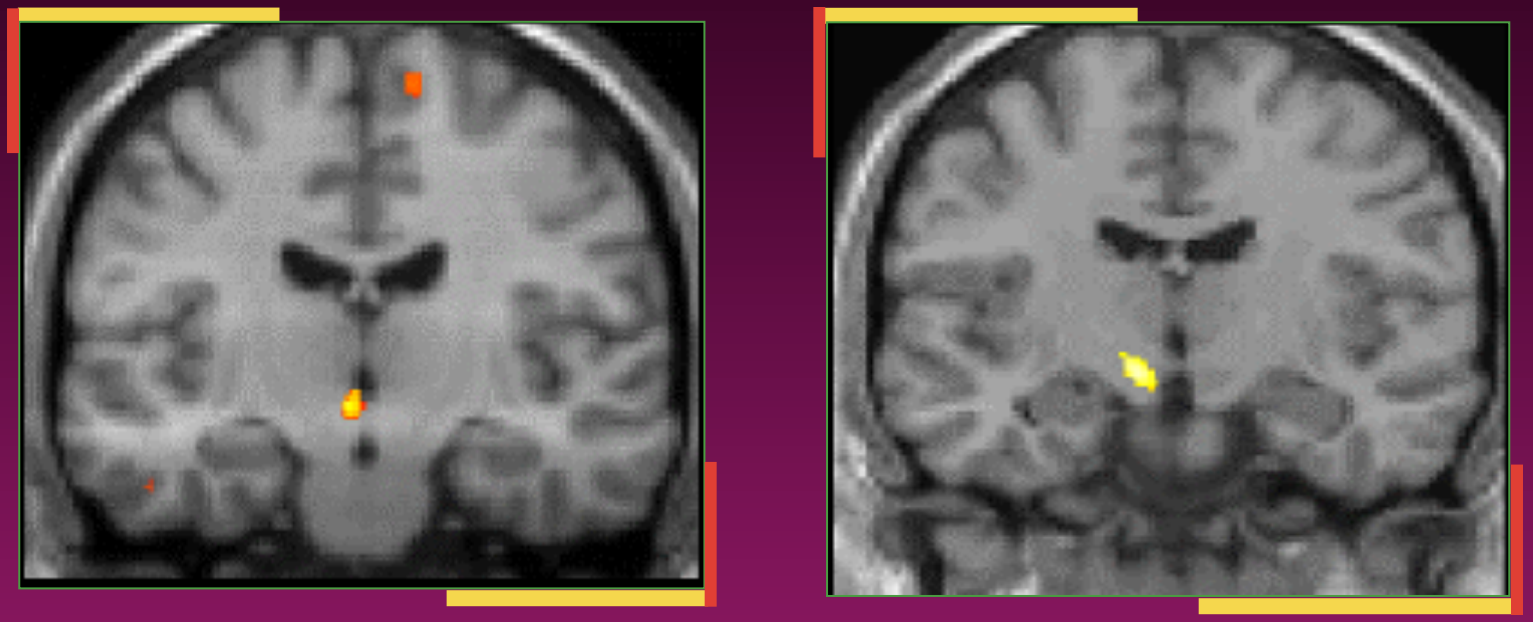


Goadsby. *NEJM* 2000

Cluster Headache: Pathophysiology

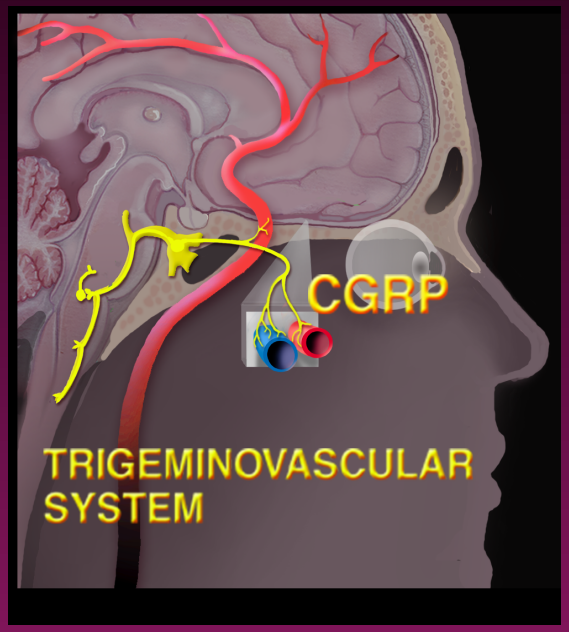
- Not fully understood
- Pain distribution suggests activation of trigeminovascular pathways
- Associated autonomic signs implicate blood-flow changes within cavernous sinus or stimulation of the trigeminal autonomic pathway
- Temporal profile (circadian pattern) of attacks and seasonal (circannual pattern) suggest disruption of hypothalamic circadian rhythm (Kudrow)
- PET studies reveal increased metabolic activity in ipsilateral hypothalamic suprachiasmatic nucleus (May & Goadsby)
- Leone/Bussone: DBS in SC nucleus successful in 18 pts

Hypothalamic Dysfunction- Cluster and SUNCT

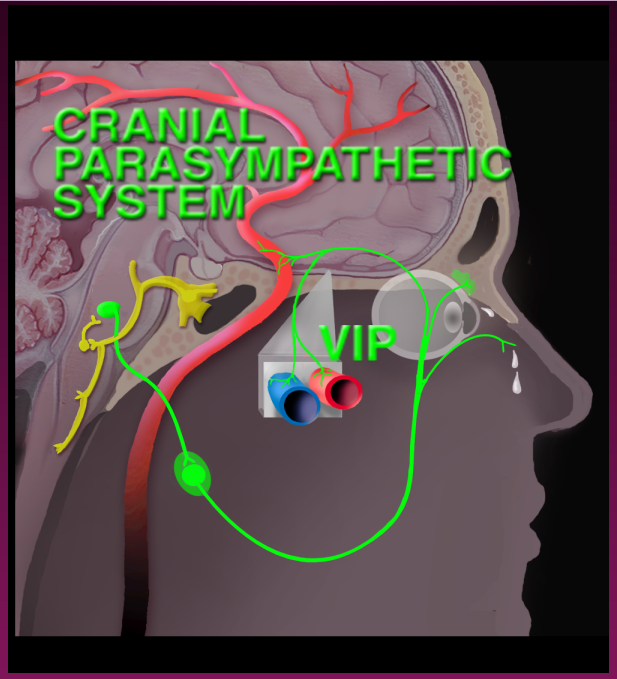


May A et al. *Lancet*. 1998; *Nat Med*. 1999; *Neurology*. 2000.

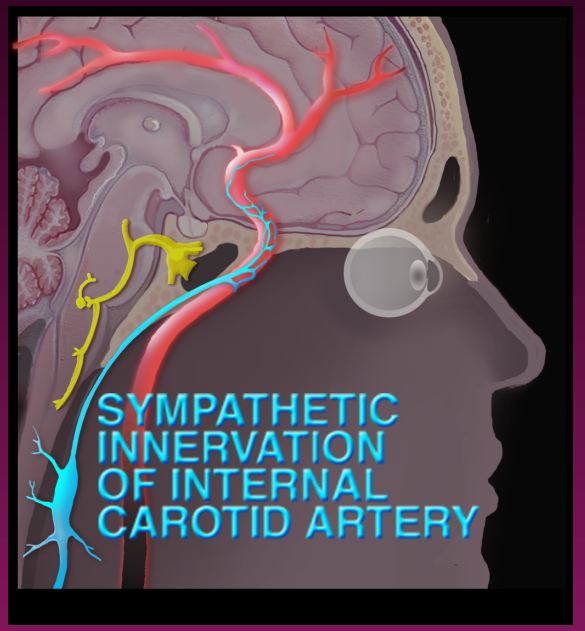
Pathogenesis of Pain: Autonomic Signs



Trigeminovascular activation (CGRP)



Parasympathetic activation (VIP)



Internal carotid artery dilation (cavernous)

Edvinsson L, Goadsby PJ. *Eur J Neurol*. 1998.

Cluster Headache Definitions

- Cluster Period - Time during which attacks recur on a daily basis
- Typical cycle lasts 4-8 weeks (range 2 weeks to 6 months)
- Remission Period - Time during which patient experiences no headaches - even if exposed to triggers
- Typical remission period lasts 6-12 months

3.1 Cluster headache

ICHD 3 beta

A. At least 5 attacks fulfilling criteria B-D

B. Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15-180 min (when untreated)

C. Either or both of the following:

1. ≥1 of the following ipsilateral symptoms or signs:

a) conjunctival injection and/or lacrimation; b) nasal congestion and/or rhinorrhoea; c) eyelid oedema; d) fore-head and facial sweating; e) forehead and facial flushing;

f) sensation of fullness in the ear; g) miosis and/or ptosis

2. a sense of restlessness or agitation

D. Frequency from 1/2 d to 8/d for > half the time when active

E. Not better accounted for by another ICHD-3 diagnosis

Cluster Headache: Clinical Features

- Headaches are unilateral, rare side-shift
- Maximal pain is retro- and peri-orbital
- Pain may radiate into ipsilateral temple, jaw, upper teeth and neck
- Pain is excruciatingly severe, with tremendous pressure or “hot poker”
- Pacing or rocking activity (now diagnostic)
- “Suicide headache”

Cluster Headache: Differential Diagnosis

- Primary Headache Disorders:
  - The paroxysmal hemicranias
  - SUNCT syndrome
  - Hemicrania continua
  - Hypnic headache
- Secondary Headache Disorders
  - AVMs
  - Aneurysms
  - Tumors (cervical, sphenoid, maxillary, ***pituitary***)
  - Giant cell arteritis
  - Dissection
  - Venous sinus occlusion

Cluster Headache Comorbidities and Mimics

- Obstructive sleep apnea (58%)
  - 8-fold increased risk
  - 24X (BMI > 24)
  - 13X (Age >40)
- Tobacco (85%) and alcohol abuse
- Arterial dissection
- Sinusitis
- Glaucoma
- Intracranial lesions
  - Pituitary / parasellar

Nobre ME, et al. Cephalalgia 2005;25:488-92.

Cluster Headache: Acute Treatment Options

- 100% oxygen inhalation at 7-10 liters/min. (up to 15L/min if refractory) (Todd Rozen)
- Sumatriptan 6 mg sc at headache onset
- DHE 45 0.5-1.0 mg SC,IM,IV
- Zolmitriptan 5 or 10 mg nasal spray
- Ergotamine tartrate SL,PO or PR
- Lidocaine 4-6% nasal drops at headache onset and 14 min later
- Methylphenidate 5 mg prn headache ?
- Olanzapine ?

Cluster Headache: Preventive Therapies

- Verapamil 120-480 mg/day (or higher)
- Methysergide (not available anymore)
- Methylergonovine (Methergine) 0.2-0.4 mg tid
- Lithium carbonate 300-900 mg/day
- Sodium valproate 250-1500 mg/day (Kuritzky)
- Gabapentin 1800-3000 mg/day
- Indomethacin 75-250 mg/day
- Topiramate (50 to 300 mg) ?
- Melatonin ?
- Methylphenidate 5-15 mg/day ?
- ***Ergotamine tartrate up to 4 mg/day***
  - ***HS to prevent nocturnal attacks (KUDROW)***

Trigeminal Autonomic Cephalgias Evidence-Based Treatment

	Treatment of choice		
Therapy	Cluster headache	Paroxysmal hemicrania	SUNCT syndrome
Acute	100% O_2, 15 l/min (A)	None	None
	Suma 6 mg s.c. (A)		
	Suma 20 mg nasal (A)		
	Zolmi 10 mg nasal (A)		
	Zolmitriptan 10 mg oral (B)		
	Lidocaine nasal (B)		
	Octreotide (B)		
A denotes effective, B denotes probably effective, C denotes possibly effective. (suma=sumatriptan; zolmi=zolmitriptan)			

- EFNS Guidelines. May A et al, Eur J Neurol 2006;13 (10):1066–1077

Trigeminal Autonomic Cephalgias Evidence-Based Treatment

Therapy	Treatment of choice		
	Cluster headache	**Paroxysmal hemicrania**	**SUNCT syndrome**
Preventive	Verapamil (A)	Indomethacin (A)	Topiramate (B) *
	Corticosteroids (A) (PO/ONB)*	Verapamil (C)	Lamotrigine (C)
	Lithium carbonate (B)	NSAIDs (C)	Gabapentin (C) *
	Methysergide (B)		
	Topiramate (B)		
	Ergotamin tartrate (B)		
	Valproic acid (C)		
	Melatonin (C)		
	Gabapentin (C) *		
A denotes effective, B denotes probably effective, C denotes possibly effective.			

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References

- May A et al. *Lancet*. 1998; *Nat Med*. 1999; *Neurol*ogy. 2000
- Edvinsson L, Goadsby PJ. *Eur J Neurol*. 1998.
- Kudrow L. Cluster Headache 1980, Oxford University Press
- Tronvik E Cephalalgia. 2013
- May A et al, EFNS Guidelines. Eur J Neurol