# **Cleveland Clinic** Headache as an Indication for Surgery in Non-Functioning Pituitary Adenoma Florida and Rathke's Cleft Cyst: A Systematic Review

Mohammadmahdi Sabahi, MD.MPH<sup>1</sup>, Adrianna Wierzbicka, MD<sup>1</sup>, Hediye Gholamshahi, MD.MPH<sup>2</sup>, Alireza Soltani Khaboushan, MD.MPH<sup>2</sup>, Farhang Rashidi,

MD.MPH<sup>2</sup>, Mohammad Mofatteh, Ph.D., M.P.H. (Hons)<sup>3</sup>, Anam Baig, DO<sup>4</sup>, Badih Adada, MD<sup>1</sup>, Hamid Borghei-Razavi, MD<sup>1</sup>

1) Department of Neurological Surgery, Pauline Braathen Neurological Center, Cleveland Clinic Florida, Weston, FL, USA. 2) Department of Medical Sciences, Tehran, Iran.Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran.Faculty of Medical Sciences, Tehran, Iran Iran. 3) School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, UK; Neuro International Collaboration (NIC), London, UK. 4) Department of Neurology, Pauline Braathen Neurology, Pauline Braathen Neurological Center, Cleveland Clinic Florida, Weston, FL, USA.

#### Headaches are common a presentation in clinical practice, necessitating often further evaluation and management. This study aims to comprehensively available literature analyze regarding headaches as an absolute surgical indication for with nonfunctioning patients pituitary adenomas (NFPAs) and Rathke's cleft cysts (RCCs), shedding light on postoperative

## Pituitary Gland

# Hypothalamus Posterior Pituitary stalk lobe Anterior lobe **Pituitary gland**

## Results

A total of 13 studies met the inclusion criteria, comprising 183 individuals who underwent surgical intervention for headaches caused by NFPA (n=111) or RCC (n=75).

	d	emographi	CS	Tur	nor speci	ifics	Surgery				
study	Patients, N	Male/fem ale	Mean age (y)	NFPA	RCC	Tumor size, mm	Endoscopic, N	TSS, N	Other, N	Adjuvant therapy	
Abe, 1998	2	2 2/0 12.5		2	0 24.5		0 0		Trans nasal:2	N/R	
Edvardsson , 2014	1	1/0	49	1	0	7140	N/R			sumatriptan - high-flow oxygen verapamil	
Fleseriu, 2009	26	3/23	37	15	11 N/R		0 26		0	N/R	
Frank, 2004	3	3/0	44	0	3	N/R	3	0	0	N/R	
Jang, 2019	40	19/21	51.91	40	0	32	0	40	0	Hormone replacement therapy: 17	
<b>Jiang, 2018</b>	13	5/8	45.1	0	13	17	13 (		0	N/R	
Komatsu, 2010	2	1/1	51	0	2	N/R	0	2	0	N/R	
Lazutkin, 2022	4	0/4	34	0	4	7	4	0	0	N/R	
Madhok, 2010	26	N/R	N/R	0	26	N/R	26	0	0	N/R	
Mathios, 2023	10	3/7	35	0	10	6	10	0	0	N/R	
Shepard, 2017	4	2/2	15	0	4	10	4	0	0	N/R	
Yu, 2016	53	N/R	N/R	53	0	N/R	0	53	0	N/R	
Zada, 2009	2	0/2	12	0	2	N/R	I	N/R			

headache resolution, and surgical complications.



## **Material and Methods**

Introduction

Following PRISMA guidelines, PubMed, Scopus, Embase, and Web of Science were searched until October 10<sup>th</sup>, 2023, using specified keywords. Inclusion criteria involved studies describing patients with NFPA or RCC, where headache was the sole surgical indication. Data were extracted, and quality assessed using the Joanna Briggs Institute (JBI) checklist.



The majority of patients experienced headache improvement (75.8%), while persistent headaches were noted in 19.8%, and worsening in 4.3%. Headache recurrence was infrequent (7.1%), and postoperative complications including transient diabetes insipidus (29.4%), cerebrospinal fluid leak (17.6%), postoperative infection (17.6%), and adrenal insufficiency (17.6%) were reported.

	Effect of	surgery on head	lache	Follow up					
Study	Improvement	Persistence	worsened	Headache	Length,	complications			

recurrence

months



### Conclusion

Surgical interventions significantly improved headache resolution in patients with NFPAs and RCCs, especially with few recurrences and manageable complications. Further prospective research with standardized protocols long-term follow-up is essential to validate and headaches as a sole indication for surgery in these patients and optimize outcomes.

1																						
A		be, 19	998	2				0			0		0		24 .	24 & 84		N/R				
Edvardsson, 2014			1				0			0		0		1	17		N/R					
Fleseriu, 2009				22				4			0		N/R		N	N/R		N/R				
٦	6		Fr	ank, 2	2004	3				0			0		N/R		42	42.3		N/R		
		Ja	ng, 2(	019#	10				18			7	7		N/R		6		N/R			
			Jiang, 2018			11				2			0		0		10	16.6		DI:3, temp CSF leak:1 post-op infection:1		
	Komatsu, 2010			2				0			0		N/R		N	N/R		N/R				
Lazut			utkin,	, 2022		3			0			1		N/R		N	N/R		N/R			
	Madhok, 2010			25				1			0		N/R		1	19		N/R				
		Mathios, 2023			10				0			0		2		3	32		N/R			
	Shepard, 2017 Yu, 2016			3				1			0		N/R		Ç	91		DI:2, temp adrenal insufficiency: 2				
				47				6			0		N/R		N/R		N/R					
	Zada, 2009		009	2				0			0		0		96		N/R					
	D1	D2	D3	D4	R D5	lisk of bia	s D7	D8	<b>D</b> 9	D10							F	Risk of bia	S			
	+	+	+	-	+	+	+	+	-	?				D1	D2	D3	D4	D5	D6	D7	D8	0
	+	+	+	-	+	+	+	+	-	?		Edva	rdsson, 2014	+	+	+	+	+	+	+	+	
	+	+	+	-	+	+	+	×	-	?		Kon	natsu, 2010	+	+	+	+	+	+	+	+	
	+	+	+	-	+	X	+	+	?	?	tudy	Abe	et al, 1998		X	+	+	+	+	+	+	
	+	+	+	-	X	+	+	+	-	· ? »		Fran	k et al. 2004				+					1
	+	+	+	-	+	+	+	+	-	+		7										
D	1: Were th	nere clear d	criteria for i	nclusion in t	the case ser	ries?	+		-	Judge	em	Zada	a et al, 2009	D1: Were	patient's de			s clearly de	scribed?	-	.ludae	ment
D	2: Was the	e condition	measured	in a standa	ard reliable v	way for all r	articipants	included in	the case s	series?					the notiont's	histowy also		Lend and a			ouuge	mont

### Quality assessment using JBI checklists indicated variable risk of bias across studies.

D3: Were valid methods used for identification of the condition for all participants included in the case series D4: Did the case series have consecutive inclusion of participants? D5: Did the case series have complete inclusion of participants? D6: Was there clear reporting of the demographics of the participants in the study? D7: Was there clear reporting of clinical information of the participants? D8: Were the outcomes or follow up results of cases clearly reported? D9: Was there clear reporting of the presenting site(s)/clinic(s) demographic information? D10: Was statistical analysis appropriate?

D2: Was the patient's history clearly described and presented as a timeline D3: Was the current clinical condition of the patient on presentation clearly described? D4: Were diagnostic tests or assessment methods and the results clearly described? D5: Was the intervention(s) or treatment procedure(s) clearly described Not applicable D6: Was the post-intervention clinical condition clearly described? D7: Were adverse events (harms) or unanticipated events identified and described D8: Does the case report provide takeaway lessons?

# North American Skull Base Society **34<sup>th</sup> Annual Meeting**

#### and 9<sup>th</sup> World Congress of the World Federation of Skull Base Societies

#### The Unified Skull Base

February 14-16, 2025 Sheraton, New Orleans, LA



Fleseriu et al, 2009

Jiang et al, 2019

Lazutkin et al, 2022

Madhok et al, 2010

Mathios et al, 2023

Shepard et al, 2017

Yu et al, 2016



Nc

#### Mohammadmahdi Sabahi, MD.MPH

Postdoctoral Research Fellow

Department of Neurological Surgery, Cleveland Clinic Florida

2950 Cleveland Clinic Blvd., Weston, FL, 33331

#### Cell: (412) 239 3665

Email: sabahim2@ccf.org



