

 **Съезд**
Congress



5-7 сентября 2018 / Санкт-Петербург
September 5-7, 2018 / St. Petersburg



Prof. Alexander Ioscovich

*Chair of the Department of Obstetric and Ambulatory Anesthesia,
Shaare Zedek Medical Center, Hebrew University, Jerusalem*

Post Dural Puncture Headache - old problem in 2018



Shaare Zedek Medical Center, Jerusalem



16.000+6.000 labors annually

12% of caesarean sections

53-55% of epidural analgesia

~ 15.000 "Obstetric anesthesia activity" cases



איגוד הרופאים המרדמיים בישראל

מפגש של החוג להרדמה מיילדותית בנושא

מבט כללי על PDPH

המפגש יוקדש לזכרה של ד"ר נטלי פירמן ז"ל

יום שישי 24 ביוני 2016, בית סוראסקי, תל השומר

מנחה - ד"ר אלכסנדר יוסקוביץ, יושב ראש החוג

08:00-09:00 התכנסות וכיבוד קל

9:00-09:20 דברי פתיחה ד"ר יוחנן שיפמן מנהל מחלקת הרדמה ביה"ח הדסה "הר הצופים"

9:20-09:45 PDPH - מבט של נירחלוג ד"ר רוני אנטל ביה"ח שערי צדק

9:45-10:10 PDPH - מבט הרדמתי ד"ר שלמה פירמן ביה"ח בילינסון

10:10-10:30 Major complications of dural puncture ד"ר שמעון פירמן ביה"ח הדסה עין כרם

10:30-10:45 "Please stop using large bore cutting spinal needles for lumbar

puncture". פרופ' יהודה גינסר ביה"ח הדסה עין כרם

10:45-11:00 דיון: פרופ' יהודה גינסר, פרופ' קרולין ויינגר

11:00-11:20 הפסקת קפה

11:20-11:45 Low CSF Pressure Headache - Pain clinic point of view.

ד"ר אדריאן גרונופילד וד"ר נטלי פירמן ביה"ח "שיבא" תל השומר

11:45-12:05 תוצאות ראשוניות של סקר ארצי על גישה ל PDPH ד"ר דניאל שטלם ביה"ח שערי צדק

12:05-12:20 דף הסכמה אחיד לביצוע Blood Patch ד"ר אלכסנדר יוסקוביץ, ביה"ח שערי צדק

12:20-12:30 דיון



European Society of Anaesthesiology



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Home > Research > Overview > Ongoing Trials > EPiMAP Obstetrics

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CLINICAL TRIAL NETWORK



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Ongoing Trials

EPiMAP Obstetrics

APRICOT

EPiMAP Obstetrics

About EPiMAP

Objectives

Timeline

Join the study

Documents Protocol and



EPiMAP Obstetrics: European Practices in the Management of Accidental dural Puncture in Obstetrics: European prospective multicentre observational audit to MAP out current practices in

End of 2018



Karl August Gustav Bier

- 1861 - 1949
- **Professor of Surgery** and Chief Surgeon at the Charité – University (Berlin)
- IV regional anesthesia – **Bier Block**
- **First operation under spinal anesthesia – 1898**
- Discovery of **PDPH Phenomena**

~ 2000-2003

30 min

~2016 - 2018



Israel national PDPH survey

PDPH

Cephalalgia 2004 ICHD-2



Cephalalgia 2013 ICHD-3

Cephalalgia
An International Journal of Headache



A. Headache worsens/improves within 15 minutes after positional change, fulfilling C and D and with at least one of:

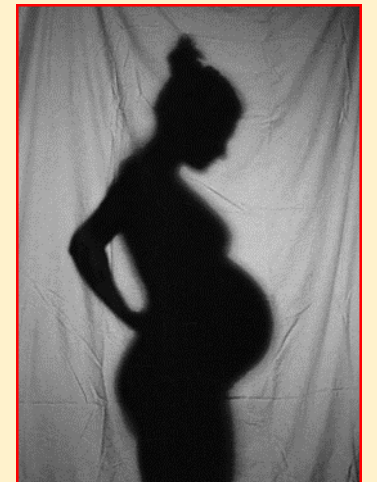
neck stiffness tinnitus hypoacusia
photophobia nausea

B. Dural puncture has been performed

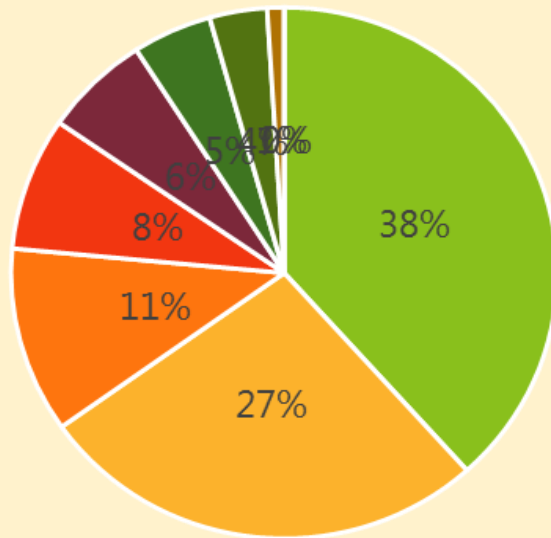
C. Headache develops within 5 days after dural puncture

D. Resolves either:

1. *Spontaneously within 1 week - 6 month*
2. With in 48 hours after effective treatment of the CSF leak
(usually by epidural blood patch)



Post Partum Headache - **Differential** Diagnosis



- tension type 38,3%
- migrainous 26,8%
- musculoskeletal 11,3%
- undertermined 8,1%
- migraine without aura 6,3%
- postdural puncture 4,7%
- cervicogenic 3,4%
- migraine with aura 1%
- cluster, secondary 0%

➤ Primary Headache

- Migraine

1/3 fertile women have migraine
(Stewart, Cephalalgia 2008)

➤ Tension Type

Primary headaches 75%
(Goldszmidt, Can J Anesth 2005)

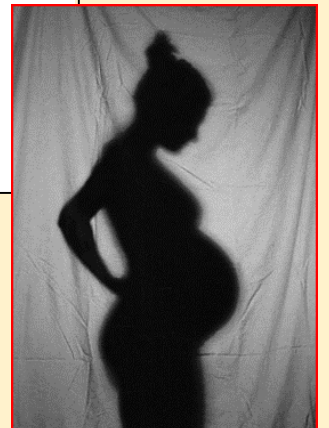
PDPH 4.7%

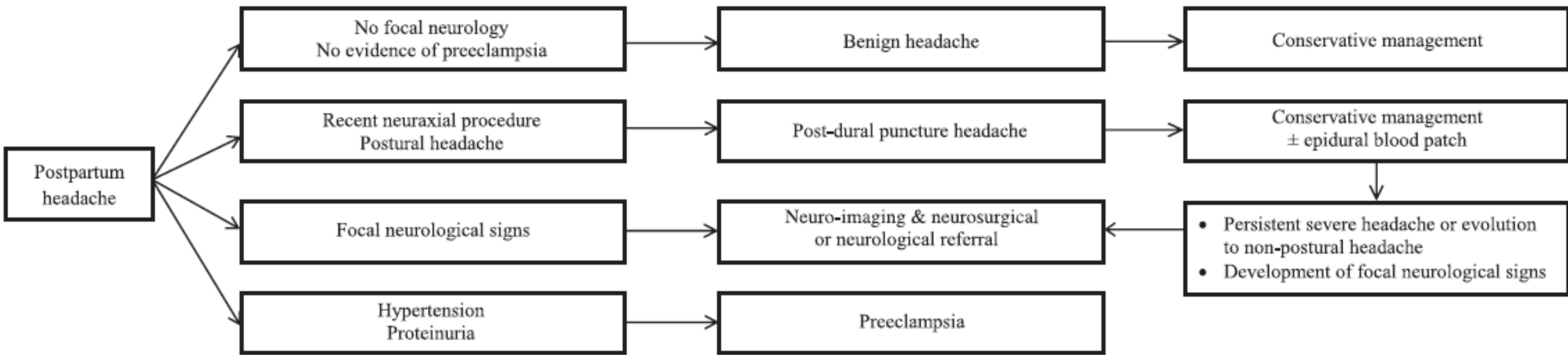
(Goldszmidt e.a. 2005)



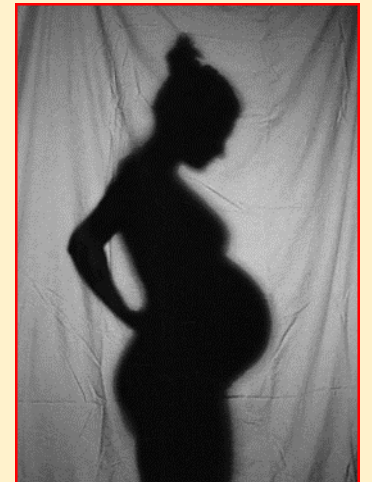
Table 3 Differential diagnosis in postpartum headache

Benign headache	Secondary headache
Migraine	Post-dural puncture headache
Tension-type headache	Subdural/subarachnoid haemorrhage
	Preeclampsia/eclampsia
	Cerebral venous sinus thrombosis
	Meningitis
	Posterior reversible encephalopathy
	Undiagnosed Arnold-Chiari malformation



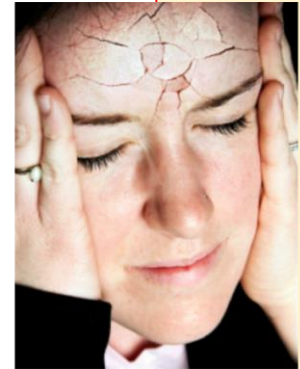


- **Every patient should**
 - Be made aware of possible complication
 - Alert anesthesiologist of unusual neurological symptoms



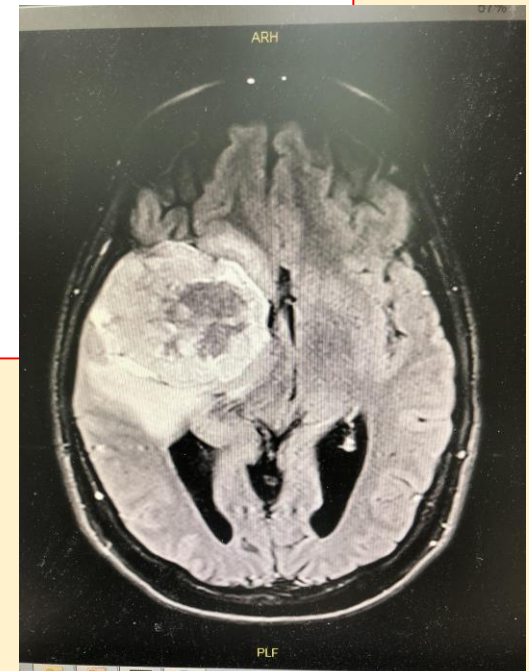
Think "**PARTUM**" in peripartum period

- **P**ressure (blood pressure for pre-eclampsia/eclampsia)
- **A**naesthetic (post-dural puncture headache)
- **R**eversible (**vasoconstriction syndrome**)
- **T**hrombosis (cerebral venous sinus thrombosis, ischaemic stroke)
- "**U**se your brain" (there are many other causes of headache!)
- **M**igraine.



- **Significant morbidity and even mortality**
(Klein, Loder IJOA 2010)

LIM SY, PRACT NEUROL 2014



Pathophysiology of PDPH

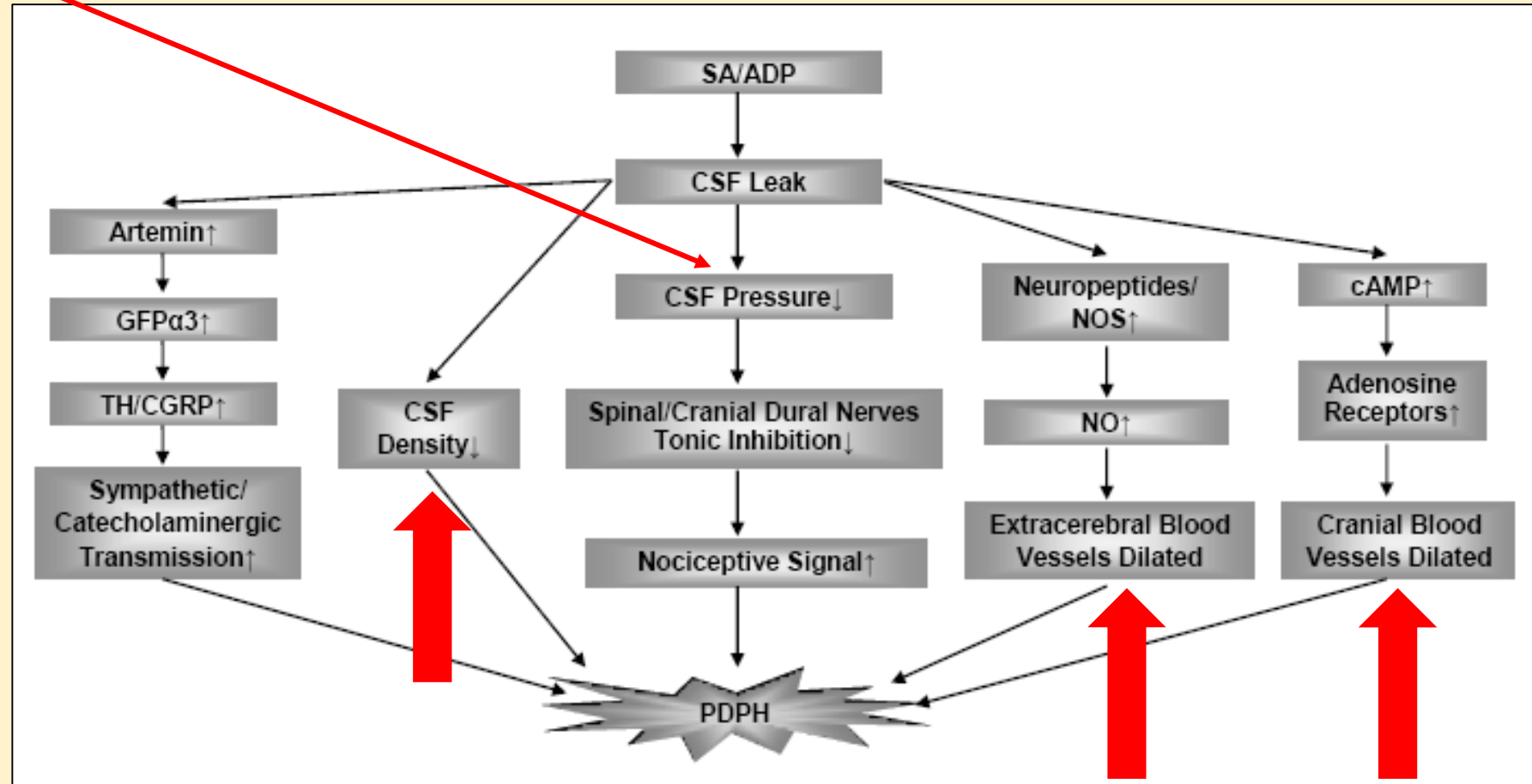
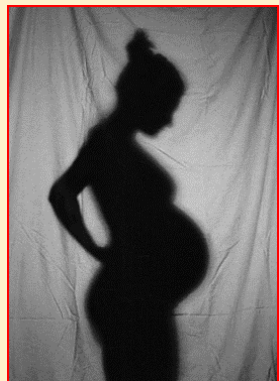
Decrease in CSF volume

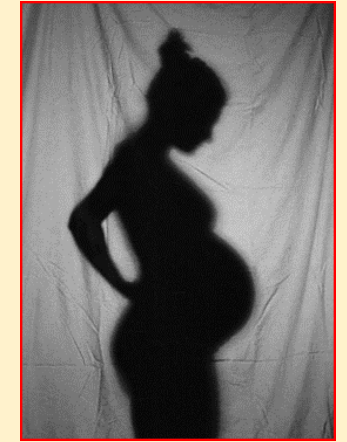
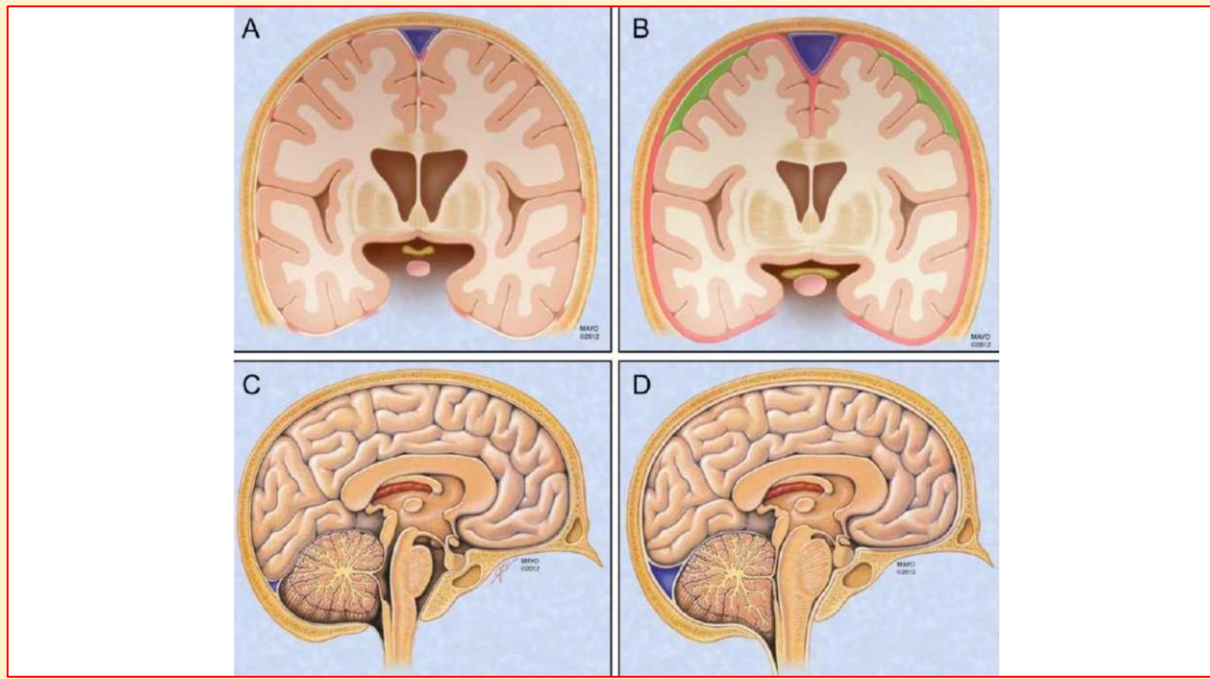


Shift of intracranial content



Stretching the meninges

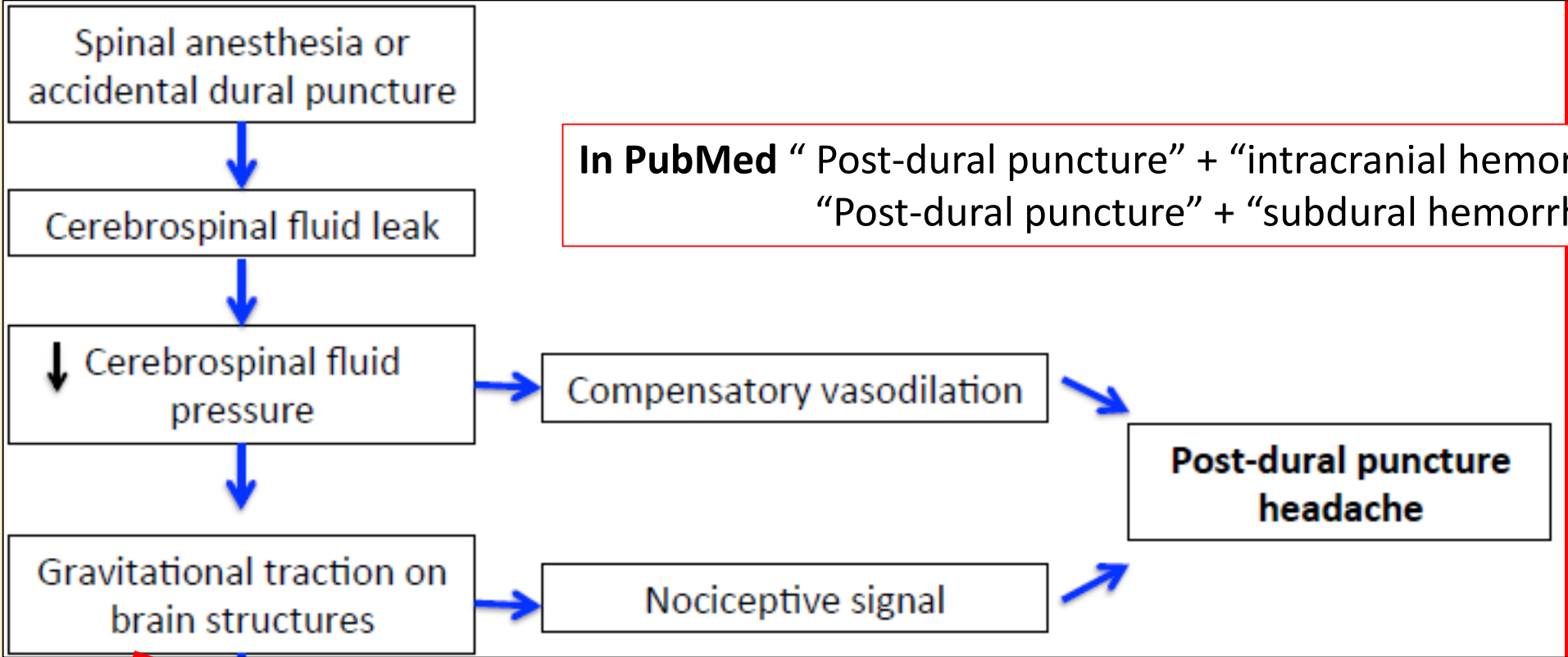




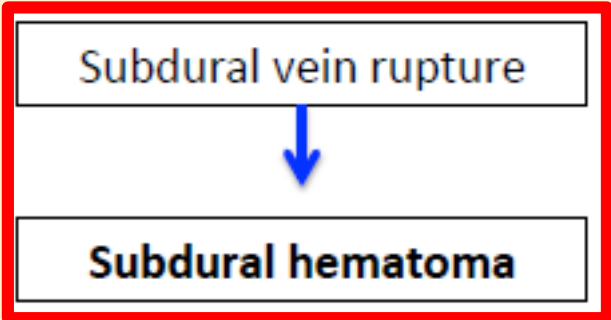
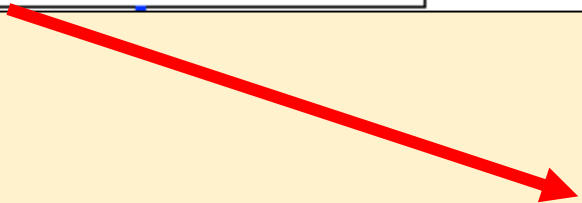
Untreated PDPH may lead to **chronic headache** or to more serious and even **life threatening** complications as **Intra Cranial Hemorrhage** and/or **Sinus Vein Thrombosis**

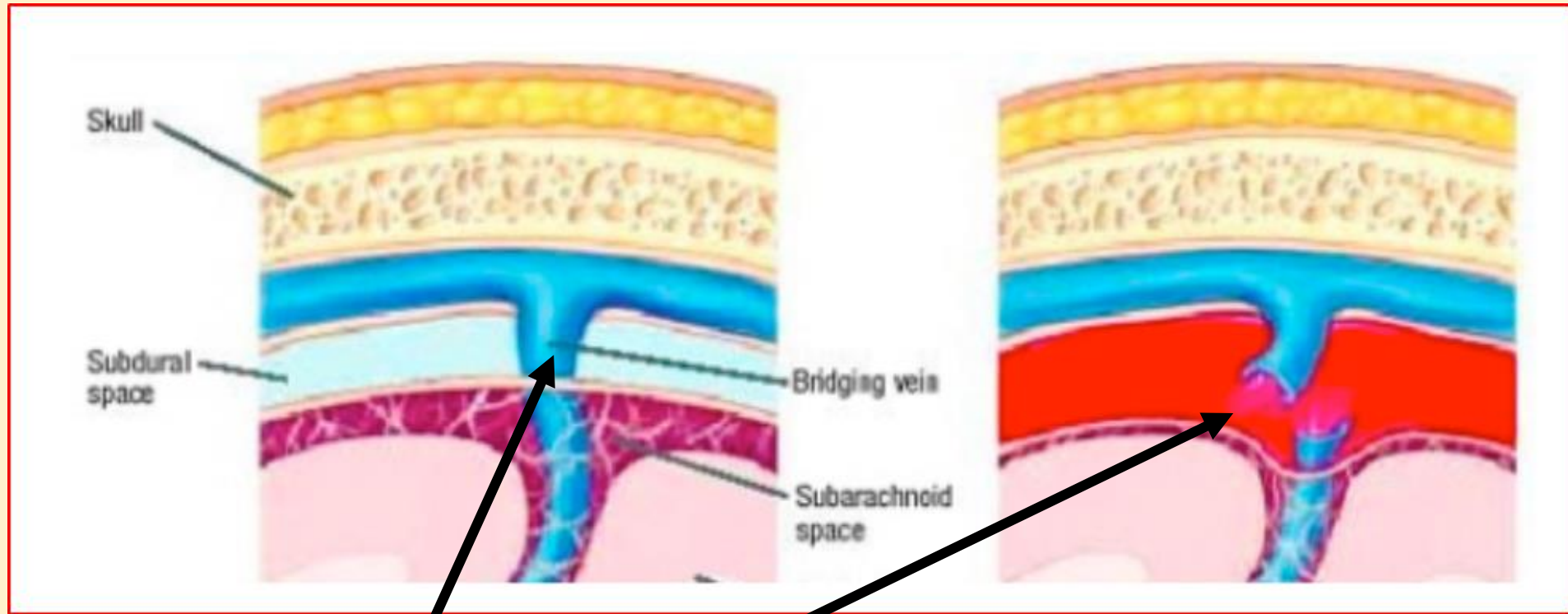
(Anesth Analg 2017;124:1219–28)

Pathophysiology of Subdural Hematoma



In PubMed “ Post-dural puncture” + “intracranial hemorrhage” – 50 results
“Post-dural puncture” + “subdural hemorrhage” – 44 results





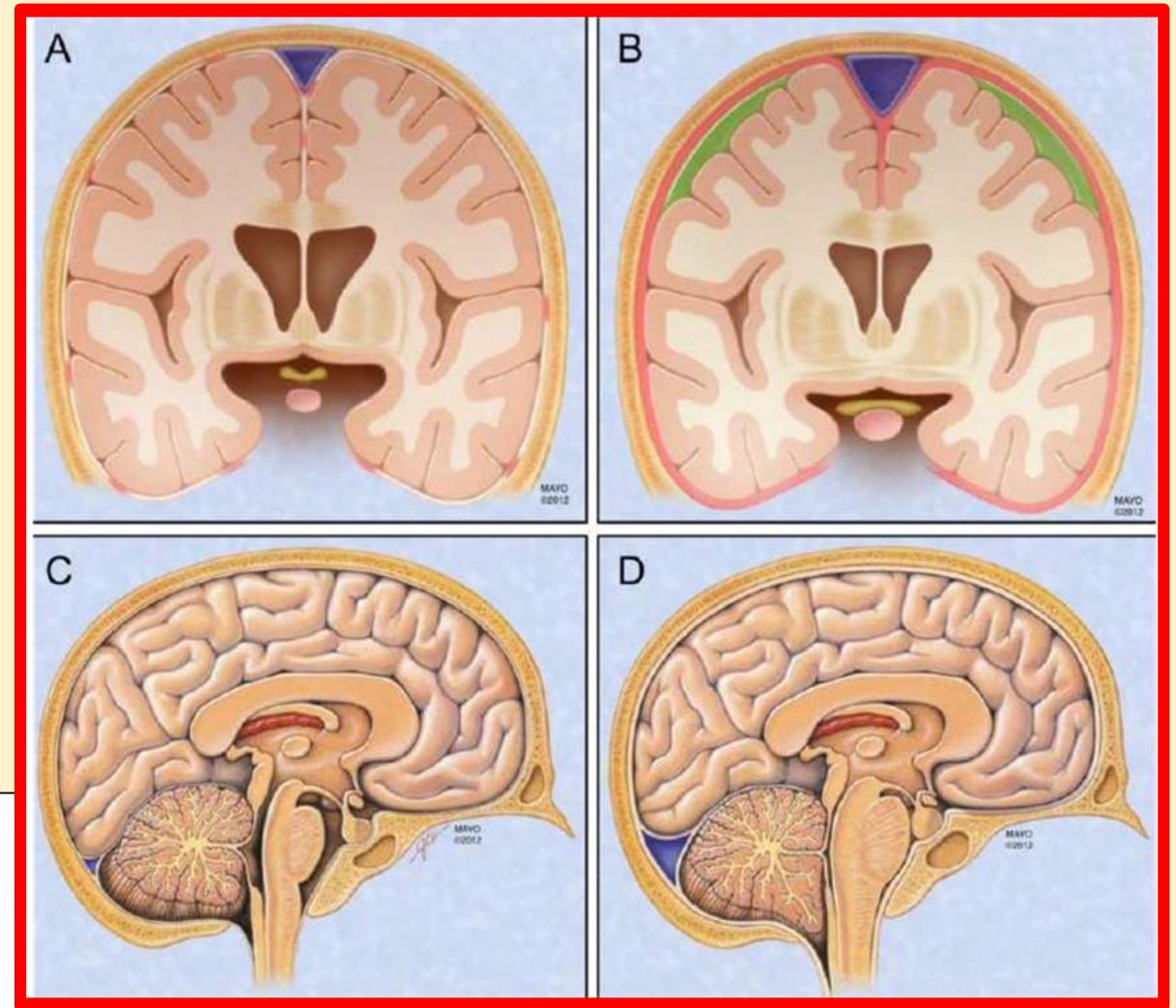
- Congestion and
- Tension of the **BRIDGING VEINS**

**Rupture and subdural
hematoma**

Pathophysiology of the Sinus Vein Thrombosis

- Decreased flow in venules
- Decreased flow in sinuses
- Hypercoagulated state

- Sinus vein thrombosis
- F:M 3:1
- in general population - 1:100,000.
- During pregnancy - **11.6:100,000**
- PubMed “Pregnancy” + “Sinus vein thrombosis” - 264



Sinus Vein Thrombosis

Our Case

- **29y.o G5P2AB2**

Delivered spontaneous normal vaginal delivery

During neuraxial analgesia, sudden onset new occipital headache

CT scan – Pneumoencephalus

Non specific occipital and upper back pain No Blood Patch

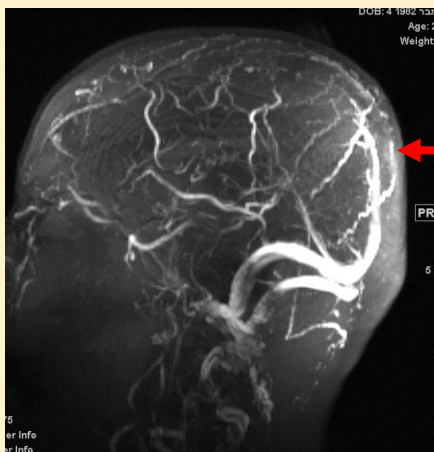
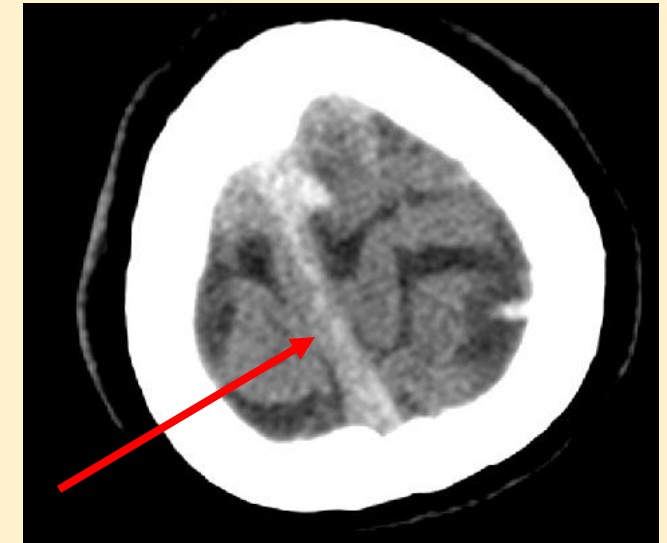
Clexane started (preventive dose, d/t immobilization)

- **PPD 10**

New onset of motor deficit

Seizures focal -> generalized

MRI/MRA/MRV – extensive symmetrical **subarachnoid hemorrhage** and **sagittal sinus thrombosis**

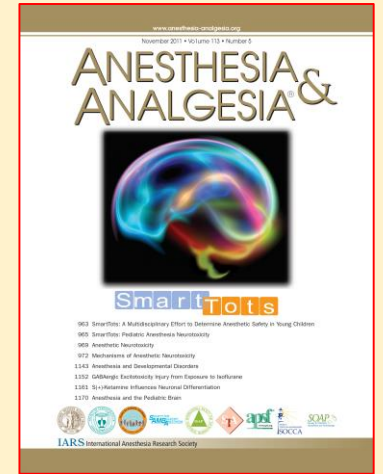


Unintentional Dural Puncture with a Tuohy Needle Increases Risk of Chronic Headache

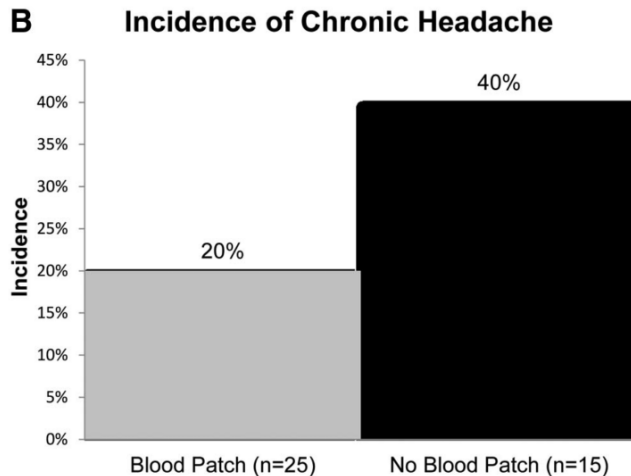
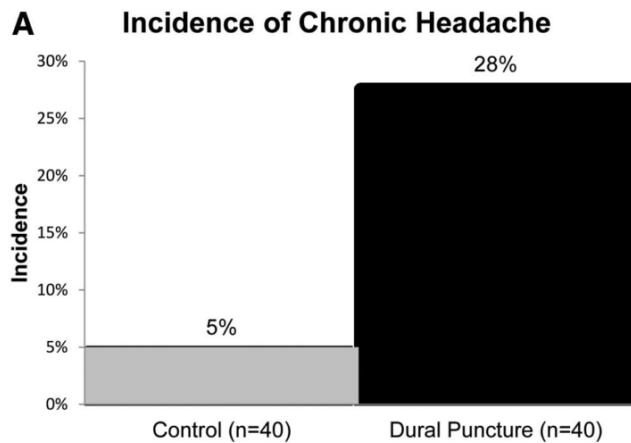
Christopher Allen-John Webb, MD, Paul David Weyker, MD, Li Zhang, MD, PhD, Susan Stanley, MD, D. Tyler Coyle, MD, Timothy Tang, Richard M. Smiley, MD, PhD, and Pamela Flood, MD

www.anesthesia-analgesia.org

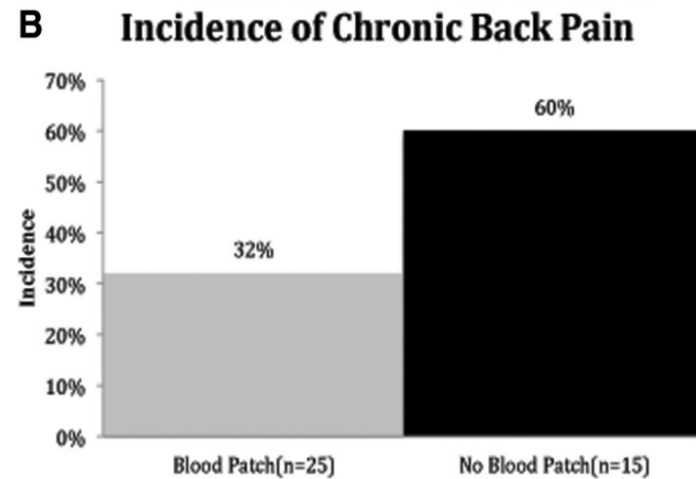
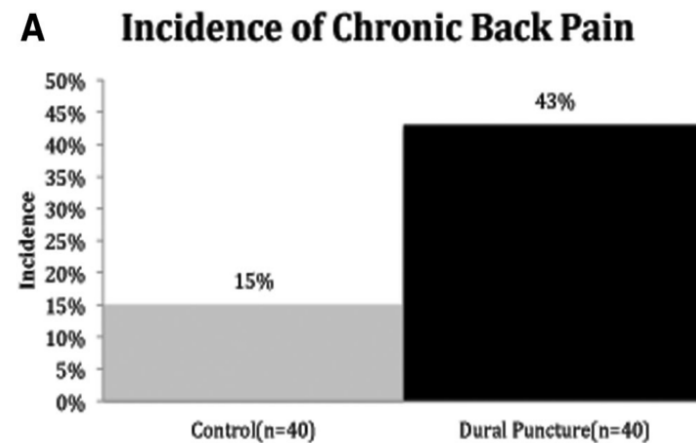
July 2012 • Volume 115 • Number 1



Chronic headache:
28 % versus 5 %



With Blood Patch – 20%
Without Blood Patch -40%



Chronic back pain:
43 % versus 15 %

With Blood Patch – 32%
Without Blood Patch -60%

How to prevent ADP or PDPH?

- Combined Spinal Epidural
- Liquid versus Air for LOR
- Patient position
- Type of catheter
- Gauge of Tuohy needle
- Use of ultrasound
- Training grade*

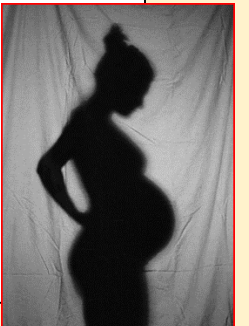
REVIEW

Can the incidence of accidental dural puncture in laboring women be reduced? A systematic review and meta-analysis

M. HEESEN¹, S. KLÖHR¹, R. ROSSAINT², M. VAN DE VELDE³, S. STRAUBE⁴

¹Department of Anesthesiology, Klinikum am Bruderwald, Bamberg, Germany; ² Department of Anesthesiology, University Hospital Aachen, Aachen, Germany; ³Department of Anesthesiology, University Hospital Gasthuisberg, Leuven, Belgium; ⁴Institute of Occupational, Social and Environmental Medicine, University Medical Center Göttingen, Göttingen

“...had no effects on the incidence of ADP or PDPH”



What is our practice?

Received: 19 March 2018 | Accepted: 15 June 2018

DOI: 10.1111/aas.13208

ORIGINAL ARTICLE

Acta Anaesthesiologica Scandinavica
AN INTERNATIONAL JOURNAL OF ANAESTHESIOLOGY AND INTENSIVE CARE, PAIN AND EMERGENCY MEDICINE

Anesthetic approach to postdural puncture headache in the peripartum period: An Israeli national survey

Alexander Ioscovich¹ | Yaara Giladi¹ | Rivka Leah Fuica¹ | Carolyn F. Weiniger² | Sharon Orbach-Zinger³ | Yaacov Gozal¹ | Daniel Shatalin¹ 



Editorial Comment
The results in this survey may help to make awareness of current clinical practice and the efficiency of treatment of PDPH in other obstetric departments. The survey may also suggest further strategies for improving and standardize treatment.

Teaching Epidural Analgesia

Acta Anaesthesiologica Scandinavica
AN INTERNATIONAL JOURNAL OF ANAESTHESIOLOGY AND INTENSIVE CARE, PAIN AND EMERGENCY MEDICINE

Management of accidental dural puncture and post-dural puncture headache after labour: a Nordic survey

B. DARVISH¹, A. GUPTA^{1,2}, S. ALAHUHTA³, V. DAHL⁴, S. HELBO-HANSEN⁵, A. THORSTEINSSON⁶, L. IRESTEDT⁷ and G. DAHLGREN⁷

Version of Record online: 29 OCT 2010
DOI: 10.1111/j.1399-6576.2010.02335.x

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Issue



Acta Anaesthesiologica Scandinavica
Volume 55, Issue 1, pages 46–53, January 2011

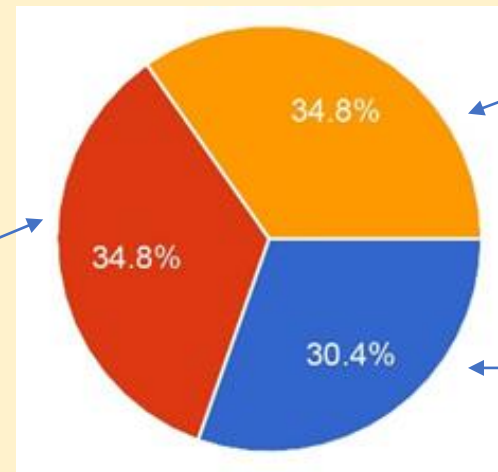
2010

- Teaching of epidurals was generally performed in the **non-obstetric population**, 86% (50–97%)
- **No formal requirements were demanded before performing epidurals in the labor ward in most Nordic countries (43–54%), except for Norway where the requirement was 10–30 epidurals**
- A majority of the hospitals felt the need for implementing a formal training program in the teaching of epidural analgesia in obstetrics, 53% (48–100%)

Israel 2016



6-12 month in the training program



> 12 month in the training program

< 6 month in the training program

Intrathecal catheter for PDPH prevention

- Apfel C. et al: British J. Of Anaesthesia 2010:

Systematic quantitative review: **no significant benefit**

Heesen M et al: IJOA 2013: Meta analysis:

Incidence PDPH reduced but not significant

Significant reduction of EBP need

Russell I. et al: IJOA 2012: Prospective controlled study:

No significant reduction of PDPH/EBP

Verstraete S. et al: Acta Anaesth. Scand. 2014: Survey

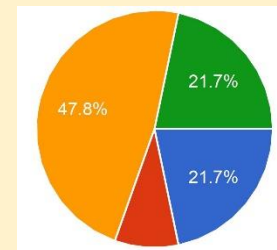
IT catheter reduced PDPH incidence 62% -> 42 %

EBP reduction 54% -> 36 %

(not significant)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America	Israel
ITC use after ADP	1%	38% may use	28% always use	18.5% always use	6% always use	13% always use

Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)



Israel survey

Catheter "in" for **47% (11) - 24h**

21.7% (5) – just for 6-12 h

21.7% (5) – remove after labor

Prophylactical Normal Saline injection

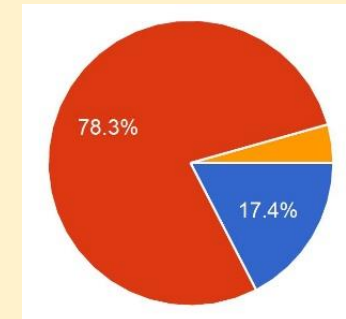
Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America	Israel
Prophylactic measures to prevent PDPH						
NS epidural injection before removal of catheter	70%	25%	18%	12% frequently 25% occasionally	7%	17%

Short-term improvements in headache

No long term benefit

(Charsley, Reg Anesth Pain Med 2001)



Israel survey:

Yes	4	17.4%
Sometimes	1	4.3%
No	18	78.3%

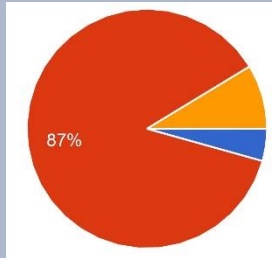
Prophylactic EBP; Yes or No?



Prophylactic EBP - No proven benefit

(RCT review, Agerson Anesth Analg 2010)

(Cochrane, Boonmak & Boonmak 2010)



Our data

4.3% (1) – yes

8.7% (2) – frequently

87% (20) - never

Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America	Israel
Prophylactic EPB	4%	37%	1%	10% frequently 31% occasionally	8%	4.3% frequently 8.7% occasionally

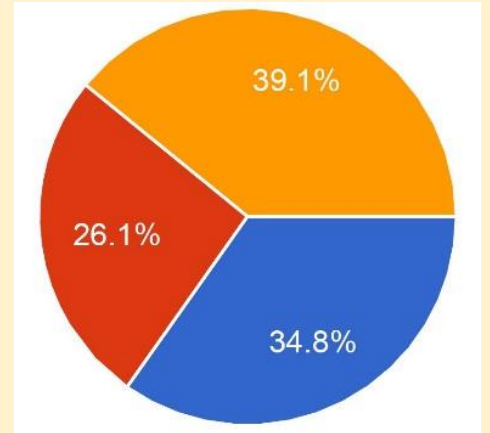
Spinal needle for CS

Incidence of PSPH for different types of spinal needles

Needle size & Type	Bevel	Incidence of PDPH%
25G Quincke	Cutting	8.7
26G Atraucan	Cutting	5
24G Gertie Marx	Atraumatic	4
24G Sprotte	Atraumatic	2.8
25G Whitacre	Atraumatic	3.1

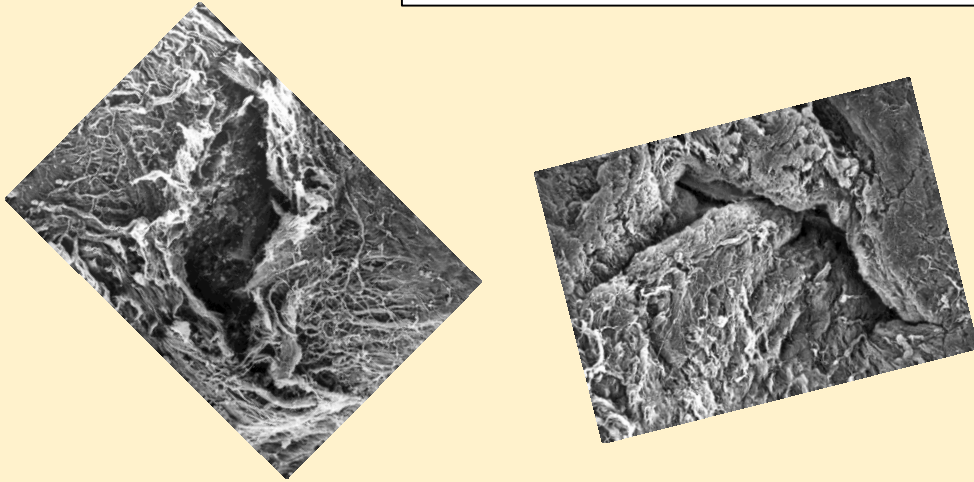
Anesth Analg. 2000;91:916-20.

0.8-2%



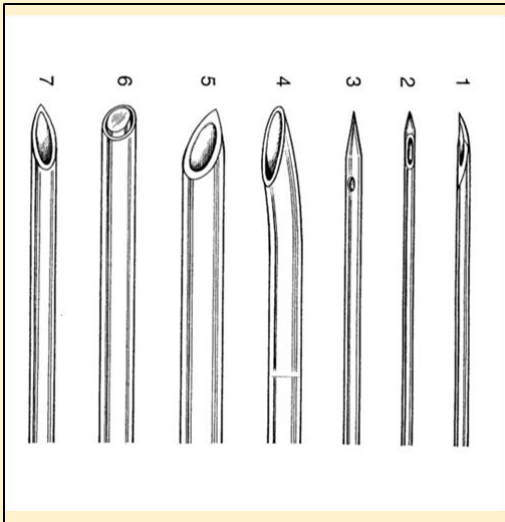
G27 8	34.8%
G26 6	26.1%
G25 9	39.1%
אחר 0	0%

Bevel Orientation



BEVEL orientation: perpendicular vs. parallel
3-fold increase in PDPH
(Norris , Anesthesiology 1989)

Atlas of Functional Anatomy for Regional Anesthesia and Pain Medicine,
Miguel Angel Reina



Nothing new!

Time from diagnosis to treatment



EBP < 24h from diagnosis of PDPH Failure 71% (8 pt.)
 EBP > 24h from diagnosis of PDPH Failure 4% (16 pt.)

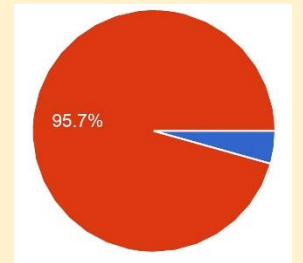
Time vs. success rate for epidural blood patch
 (Loeser EA . Anesthesiology 1978 Aug ;49(2):147-8)

EBP < 48h from Dural Puncture - Recurrence 59%
 EBP > 48h from Dural Puncture - Recurrence 11%

An audit of epidural blood patch (Banks S, Paech M, Gurrin L. Int J Obstet Anesth. 2001 Jul;10(3):172-6)

Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	2016 Israel
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America	Israel
EBP after <24h of conservative Tx	42%	44%	29%	41%	81%	4%



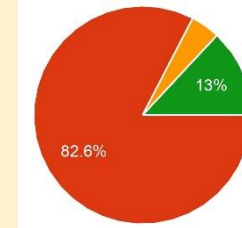
The most common time interval from diagnosis of PDPH to performing EBP was 24-48h

(*Nordic survey. Acta Anaesthesiol Scand 2011; 55: 46–53*)

In Israel 2016
 < 24 h - 4.3% (1)
 24-48 h - 95.7% (22)
 > 48 h - 0

The volume of blood for Blood Patch

82.6% (19) - 15-25mL
 13% (3) - up to high pressure filing
 4.3% (1) - >25mL



Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America	Israel
Volume of blood injected	Not reported	Not reported	Not reported	66.8% give 16-20mL	60% give 11-20mL	82.6% give 15-25mL

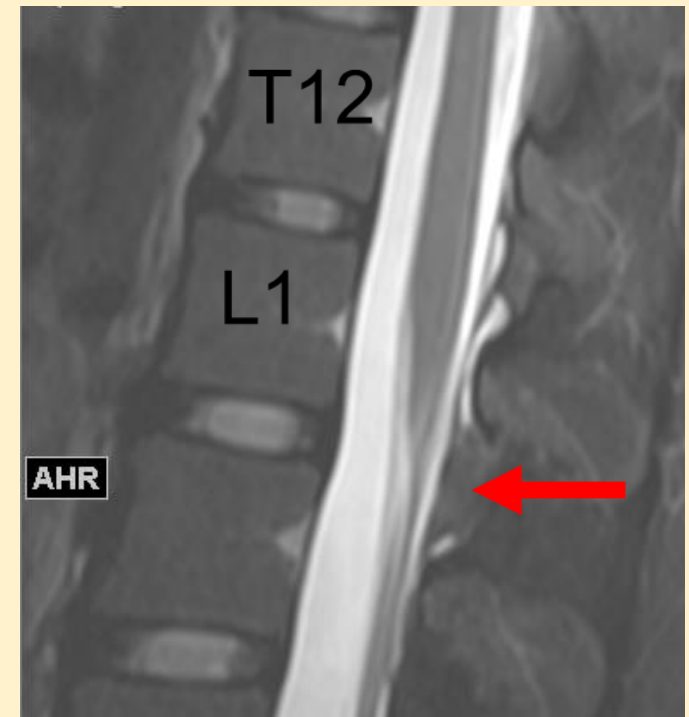
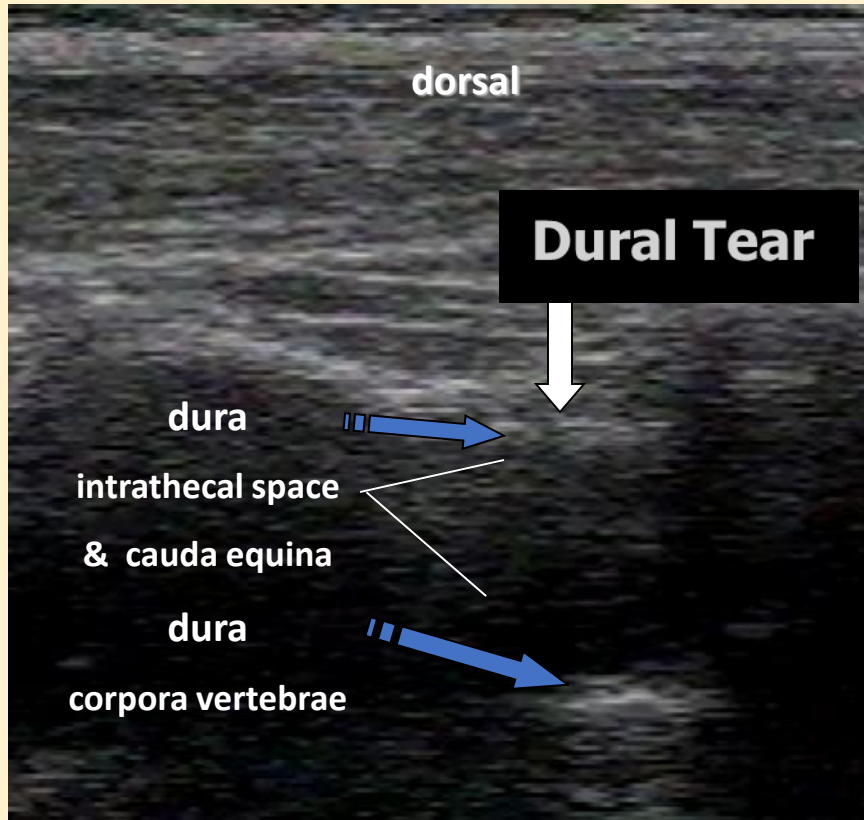
Table 4. Incidence of Headache Relief After Epidural Blood Patch

	<48 hours	≥48 hours	Overall
Permanent or partial relief			
15 mL	33.3 (9.0–65.1)	72.4 (52.8–87.3)	61.0 (44.5–75.8)
20 mL	61.5 (31.6–86.1)	78.6 (59.1–91.7)	73.2 (57.1–85.8)
30 mL	56.3 (29.9–80.3)	73.9 (51.6–89.9)	66.7 (49.8–80.9)
Permanent relief ^a			
15 mL	0.0 (0–26.5)	13.8 (3.9–31.7)	9.8 (2.7–23.1)
20 mL	15.4 (1.9–45.5)	39.3 (21.5–59.4)	32.3 (13.1–48.1)
30 mL	25.0 (7.3–52.4)	26.1 (10.2–48.4)	25.6 (13.0–42.1)

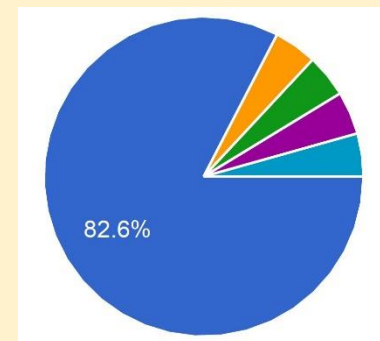
The Volume of Blood for Epidural Blood Patch in Obstetrics: A Randomized, Blinded Clinical Trial (Paech, et al. Anesthesia & Analgesia 2011)

+

Imaging for the performance of Blood Patch



6 months after ADP , 2 BP and permanent PDPH
 MRI Lumbar Spine – CSF Leak at T12-L1
 improvement and complete resolution



Always wit US – 1
 Sometime with US – 1
 Always with xR – 1
 Sometime with xR - 1

Conservative treatment of PDPH

- *Caffeine
- *Bed rest
- *Prone position
- *Theophylline
- *Aminophylline
- *ACTH
- *Gabapentin
- *Hydrocortisone
- *Pregabaline

Review of the Alternatives to Epidural Blood Patch for Treatment of Postdural Puncture Headache in the Parturient

(Anesth Analg 2017;124:1219–28)

Daniel Katz, MD, and Yaakov Beilin, MD

Table. Summary of Treatments					
Category	Subcategory	Modality	Summary of Treatments		
			Doses Reported	Clinical Efficacy	Additional Clinical Factors
Conservative therapies		Hydration	N/A	No benefit	May lead to patient discomfort because of increased micturition
		Bed rest	N/A	No benefit	May cause complications such as VTE
		Prone positioning	N/A	No benefit	Uncomfortable for the patient
		Abdominal binders	N/A	May decrease headache when applied soon after dural puncture	Uncomfortable for the patient
Medical therapies		Caffeine	300–500 mg PO or IV daily; 2–4 cups of coffee daily	No benefit	Often well tolerated, readily available
		Theophylline	250 mg PO TID; 281.7 mg PO TID; 200 mg IV once	Decreased pain scores	Narrow therapeutic window
		Aminophylline	250 mg IV over 30 minutes for 2 days	Decreased pain scores	
	HPA axis	ACTH/cosyntropin	0.25–0.75 mg over 4–8 h IV once; 1 mg IM once	Decreased pain scores and decreased need for EBP	Data highly conflicted; efficacy appears to be higher for prophylaxis than for treatment
		Hydrocortisone	200 mg/100 mg IV followed by 100 mg IV TID for 48 h	Decreased pain scores	
	Other headache medications	Sumatriptan	6 mg SQ once	No benefit	
		Methylergonovine	0.25 mg PO TID for 24 h, if efficacious repeated for 48 h	Decreased pain scores and decreased need for EBP	Results from case series only; no RCTs reported
				Decreased pain scores	May be sedating
				Decreased pain scores	May be sedating; least amount of data regarding breast-feeding
	Invasive therapies	Epidural injections of nonblood fluids	Saline	20 mL injection once; continuous infusions	Decreased pain scores
Hydroxyethyl starch			20 mL injection daily for 2 d	Decreased pain scores	Multiple injections required to sustain benefits
Fibrin glue			4 mL injection once	Decreased pain scores	Very small case series only, no RCTs, should be performed under fluoroscopy, expensive, only considered when multiple EBP have failed
Epidural injections of medications		Dexamethasone	8 mg injection once	No benefit	
		Morphine	3 mg injection once; two 3 mg injections 24 h apart	Decreased pain scores and decreased need for EBP	Studies done with catheters left in situ for second injection, postinjection respiratory monitoring may be required

Occipital nerve blocks

Greater and lesser

2 mL 0.5% bupivacaine;
4 mL 0.25% levobupivacaine; 2 mL dexamethasone (6.6 mg) with 2 mL 1% lidocaine; 4 mL 0.25% bupivacaine with triamcinolone 20 mg

Decreased pain scores and decreased need for EBP

Sphenopalatine nerve blocks

Intranasal

1 cotton-tip applicator soaked with 5% water-soluble

Decreased pain scores and decreased need for EBP



Figure 3. Identification of the greater occipital nerve (GON) and the occipital artery (OA) via ultrasound.

Figure 2 . Traditional and auricular acupuncture sites.

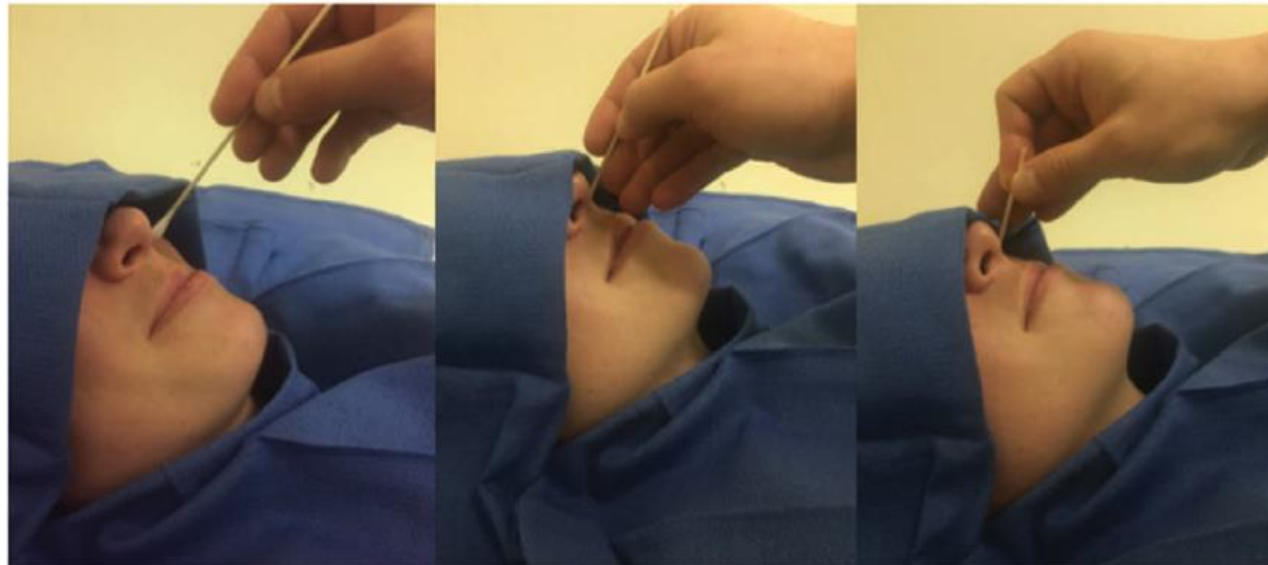
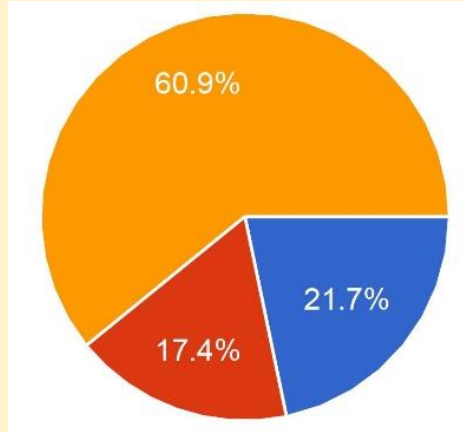


Figure 4. Advancement of local anesthetic soaked cotton-tip applicator for sphenopalatine ganglion block.



Institutional protocol for the PDPH treatment or for the performance of Blood Patch



Protocol for PDPH treatment 21.7% (5)
 Protocol just for Blood Patch 17.4% (4)
No protocols 60.9% (14%)

Surveys of Accidental Dural Puncture (ADP) and Postdural Puncture Headache (PDPH)

Study	Sajjad & Ryan	Berger et al.	Baraz & Collis	Harrington & Schmitt	Baysinger et al.	
Year	1995	1998	2005	2009	2011	2016
Location	UK	North America	UK	U.S.	North America (Mainly U.S.)	Israel
Protocol for PDPH management	58.5%	8.3%	85%	10.8%	14%	21.7%

אנף טערכת סדע
נגיעה במסך מזיקה!

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המרכז הרפואי שערי צדק (ע"ר) מסונף לביה"ס לרפואה של האוניברסיטה העברית בירושלים
SHAARE ZEDEK MEDICAL CENTER, Jerusalem Affiliated with the Hebrew University School of Medicine, Jerusalem

מחלקת הרדמה רפואה סב ניתוחית וטיפול בכאב
Department of Anesthesiology, Perioperative Medicine and Pain Treatment

אוקטובר 2017

פרוטוקול להתנהלות במקרה של דקירה לא מכוונת של קרום הדורה בזמן ביצוע הרדמה אפידורלית בחדר לידה והתפתחות של כאבי ראש לאחר מכן (Inadvertent Dural Puncture – IDP)

דקירה לא מכוונת של קרום הדורה הינו סיבוך ידוע של ביצוע הרדמה אפידורלית בכלל ואלחוש אפידורלי בחדר לידה בפרט.

לפי הספרות, שכוחות של דיקור הדורה לא מתוכנן בבתי חולים אוניברסיטאיים נע בין 0.19 – 3.6% ובמקרה שהשתמשו במחט אפידורלי G18 סיכוי להתפתחות כאבי ראש כתוצאה של הדיקור הזה מתקרב ל-70%.

כאשר בזמן ביצוע אלחוש אפידורלי בחדר לידה מרדים מבחין דיקור דורה לא מתוכנן מומלץ:

1. להוציא את המחט או הקטטר אפידורלי ולבצע חיפוש של חלל אפידורלי מחדש במרווח בין החוליות מעל או מתחת למיקום ביצוע ניסיון ראשון.
2. אין עדות חד משמעית בספרות שהשארת קטטר אפידורלי בחלל הספינלי מוריד את הסיכוי להתפתחות כאבי ראש לאחר דיקור הדורה.
3. להסביר ליולדת שקיים סיכוי שתחוש כאבי ראש בהקדם ושמצב זה מוכר וישנם שיטות לטיפולו.
4. לרשום בגיליון היולדת (בדף הרדמה) את כל הפרטים שקשורים לדיקור דורה לא מתוכנן.
5. להדביק מדבקה עם פרטים של היולדת בספר מעקב על IDP שנמצא בחדר מרדימים בקומה 9 של חדר הלידה "בשערי צדק" ובתחנת מיילדות בחדר לידה ב"ביקור חולים".
5. לדווח למחרת למרדים אחראי בחדר לידה על המקרה לצורך מעקב וטיפול.

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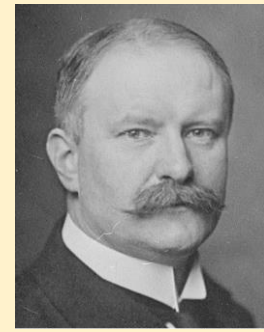
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**150-200 Consultations
of patients with PDPH**

**50-60 Blood patch
(2017 – 58)**

***SZMC Institutional
Protocol for
management of
IDP and PDPH***

Summary



Karl August Gustav Bier

- PDPH is a **“hot topic”** now
- PDPH is the cause of **only ~5% of peripartum headache**
- PDPH is a problem with **significant morbidity** and even mortality
- There is **no effective way to prevent** PDPH
- Epidural Blood Patch performed **at the right time is an effective treatment**
- **Institutional protocol** for PDPH treatment is crucial

Съезд
Congress



5-7 сентября 2018 / Санкт-Петербург
September 5-7, 2018 / St. Petersburg



Thank you!!!

