WHEN A NEW BABY LEADS TO VT

Management of adult new onset alternating esotropia

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About me

- B.S. Biology from Indiana University, December 2007
- Graduated from Indiana University School of Optometry, May 2011
- Completed Residency at Southern College of Optometry in Memphis, TN, in Pediatrics and Vision Therapy, June 2012
- Completed Fellowship in C.O.V.D. in April 2016
- Currently practicing primary care and VT in Greensburg, Indiana

Disclosures

- None

Objectives

- To report about a rare condition caused by anesthesia via epidural
- To describe the treatment plan in hopes of helping to improve clinical knowledge
- To promote a better understanding of vision therapy for myself and you

The Before – November 2013

- D.E. (36 yr. old female) presented for a ‘routine’ eye exam to renew her contact lens prescription – No problems
- Ortho @ distance; 2 exophoria at near cover test
- Ocular health WNL
- Entering spec Rx: OD: -5.25-0.75x151 OS: -5.00-0.75x025
- Manifest Rx: OD -4.75-0.75x168 20/20 OS: -4.50-0.75x015 20/20

- Renewed CL Rx and RTO in 1 year

The Before part 2– June 2016

- D.E. (39 yr. old female) presented for a ‘routine’ eye exam to renew her contact lens prescription – No problems
- Ortho @ distance; Ortho @ near cover test
- Ocular health WNL
- Manifest Rx: OD -4.50-1.00x169 20/20 OS: -4.25-1.00x011 20/20

- Renewed CL Rx and RTO in 1 year

The Incident– April 6, 2017

- D.E. (40 yr. old female) presented with complaints of diplopia that resolves with covering either eye. Diplopia is new in onset (5 days ago), constant, horizontal, and patient also has a headache and right side neck pain. Currently patching OD full time

- Second child born 3/28/17 via C-section and had a spinal tap headache leading to CSF loss, treated with Fioricet, blood patch, and HTN treated with magnesium drip.
- 45^ alt ET at distance Seen by my colleague

- Dx: Binocular diplopia and Esotropia
- Plan: Wear patch prn, use caution due to loss of depth, follow up with OB and anesthesiologist, call 911 with signs/symptoms of stroke

Epidural and Postdural Puncture Headache

- Blood patches are recommended as the gold standard for treatment of dural puncture headaches.[1]
- “Abducens nerve paresis most frequently arises 2 to 5 days” after dural puncture.[2]
- Literature review found that CN 6 was the most commonly reported cranial nerve affected in the review (~40% of cases).[3]

My First Encounter– April 10, 2017

- D.E. (40 yr. old female) returned for follow up… still patching OD to prevent diplopia. Patient thought double vision was brought on due to anesthesia/epidural.
- VA's 20/20 OD, OS, OU with habitual Rx
- 55^ ET at distance; 55^ ET at near Limited abduction OD, OS
- BP: 136/84 Corneal sensation intact
- DFE revealed no pathology affecting ocular structures

- Dx: Sixth nerve palsy OU
- Plan: Recommended bi-nasal occlusion OU. Referred to neuro-ophthalmologist (did not receive any results back). RTO 6 weeks for EOM testing and cover test

My First follow up– May 15, 2017

- D.E. (40 yr. old female) returned for follow up… minimal diplopia with bi-nasal occlusion. Feels like OD is blurry, feels pressure behind eyes, has a headache.
- VA's 20/20 OD, OS, OU with habitual Rx
- 52^ ET at distance; 52^ ET at near Limited abduction OD, OS but some returning compared to last month
- DFE revealed no pathology affecting ocular structures

- Dx: Sixth nerve palsy OU – showing some mild improvement
- Plan: Recommended continuing with bi-nasal occlusion OU. RTO 3 months for EOM testing and cover test

My Second Follow up– June 14, 2017

- D.E. (40 yr. old female) returned for follow up… having some diplopia with left eye when fixating with the right eye even with bi-nasal occlusion. Can see to the "sides with her eyes rather than turning head as much." Wonders if things are improving.
- VA's 20/20 OD, OS, OU with habitual Rx
- 45^ ET at distance; 45^ ET at near
- Still limited abduction OD, OS, some returning; can abduct to about 45 degrees temporally from primary gaze with each eye.

- Dx: Sixth nerve palsy OU – showing some improvement
- Plan: Recommended continuing with bi-nasal occlusion OU, but widening the black tape to 15 mm OD and 16 mm OS. Begin "eye stretches." RTO 3 months for EOM testing and cover test

My Third Follow up– July 24, 2017

- D.E. (40 yr. old female) returned for follow up… feels like the OD's tape is too wide and blocks the vision rather than preventing diplopia. Now does NOT have diplopia at an arm's length away without glasses. Eyes feel tired at the end of the day.
- Current Rx: OD: -4.75-0.75x168 20/20 OS: -4.50-1.00x012 20/20
- Final Rx'd lens: OD: -4.25-0.75x180 20/20 OS -4.25-1.00x180 20/20 +1.00 Add OU
- Abduction returning
- 18^ alt ET at distance; 35^ alt ET at near; 18^ BO and +1.25 eliminates diplopia at near

- Dx: Sixth nerve palsy OU – showing improvement; Binocular diplopia, Myopia
- Plan: Recommended continuing with bi-nasal occlusion OU, but narrow by 3mm OU. Consider Fresnel prism at follow up. Recommend new glasses. Continue "eye stretches." RTO 3 months for EOM testing and cover test

My fourth follow up – Sept. 14, 2017

- D.E. (40 yr. old female) returned for follow up… Only has diplopia at near. No diplopia at distance, but does see double when objects move quickly or if she moves her head quickly regardless of distance.
- Current Rx: OD: -4.25-0.75x180 20/20 OS -4.25-1.00x180 20/20 +1.00 Add OU
- Final Rx'd lens: OD: -4.00-0.75x180 20/20 OS -3.75-1.00x180 20/20 +1.00 Add OU
- 6^ intermittent alt ET at distance; 15^ alt ET at near
- Randot stereo: 40" arc at near "Very slight limitations to abduction"

- Dx: Sixth nerve palsy OU – showing improvement; Myopia
- Plan: Continue with "coin circles" (horizontal, vertical, circles, and figure 8s) both with a patch and without a patch. Recommend new glasses without binasal occlusion. Use bi-nasal occlusion OU (or patch) only when needed to eliminate diplopia. RTO 4 months for general ophthalmic exam

My Last Follow up of 2017 - Nov. 9

- D.E. (40 yr. old female) returned follow up early due to having blurry vision. “Feels like I have to strain to see far away.” Has ‘random’ double vision, still has some when moving eyes/head, but now has diplopia intermittently throughout the day. Has been doing “coin circles” and notices some diplopia during and after the activity.
- Current Rx: OD: -4.00-0.75x180 20/20 OS -3.75-1.00x180 $20/20^{-2}$ +1.00 Add OU
- Final Rx’d lens: -4.00-0.75x180 20/20 OS -4.00-1.00x180 20/20 +1.00 Add OU
- 2-3^ esophoria at distance; 10^ alt ET at near
- Motilities are not smooth, but they are full (or almost full) to abduction

- Dx: Sixth nerve palsy OU – showing improvement; Myopia
- Plan: Continue with “coin circles” (horizontal, vertical, circles, and figure 8s) both with a patch and without a patch. Recommend new OS lens. Use bi-nasal occlusion OU (or patch) only when needed to eliminate diplopia. RTO 4 months for general ophthalmic exam

First 2018 follow up – March 3, 2018

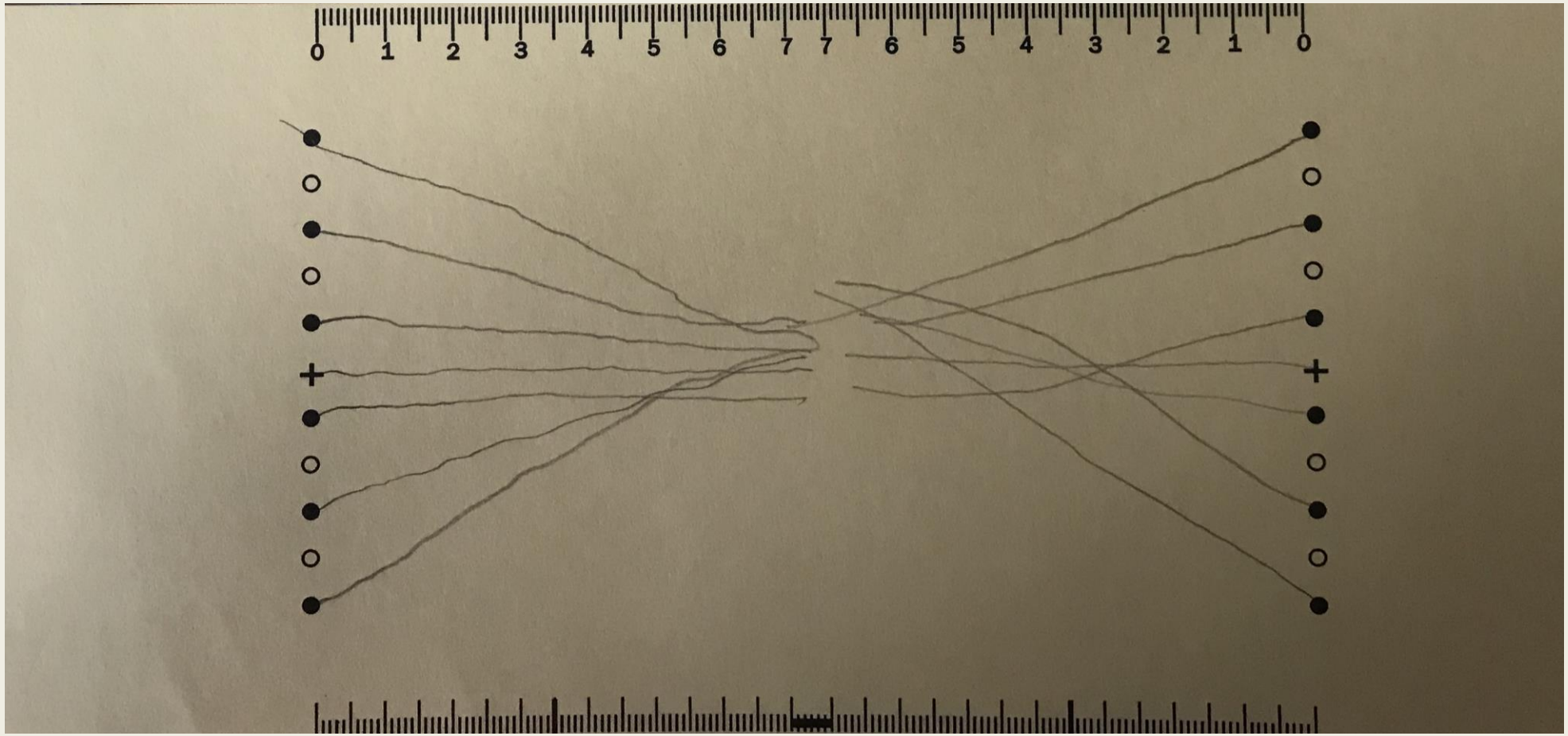
- D.E. (40 yr. old female) returned for an exam and follow up. Feels like her she is doing much better. Reported some double vision 2 months ago, and started doing coin circles again and diplopia resolved. Was able to drive comfortably last week again.
- Current Rx: OD: -4.00-0.75x180 $20/20^{-1}$ OS -4.00-1.00x180 $20/20^{-2}$ +1.00 Add OU
- Manifest refration: -4.00-1.00x180 20/20 OS -4.00-1.25x005 20/20 +1.00 Add OU
- 3^ esophoria at distance; 10^ intermittent alt ET at near; Motilities are full
- Ocular health WNL, unchanged from previous dilated fundus exams.

- Dx: Myopia; Sixth nerve palsy OU – showing great improvement;
- Plan: Keep current glasses. Continue with "coin circles" (horizontal, vertical, circles, and figure 8s) both with a patch and without a patch. Recommended in office VT if still having some diplopia. RTO 6 months for EOM testing or begin in office VT

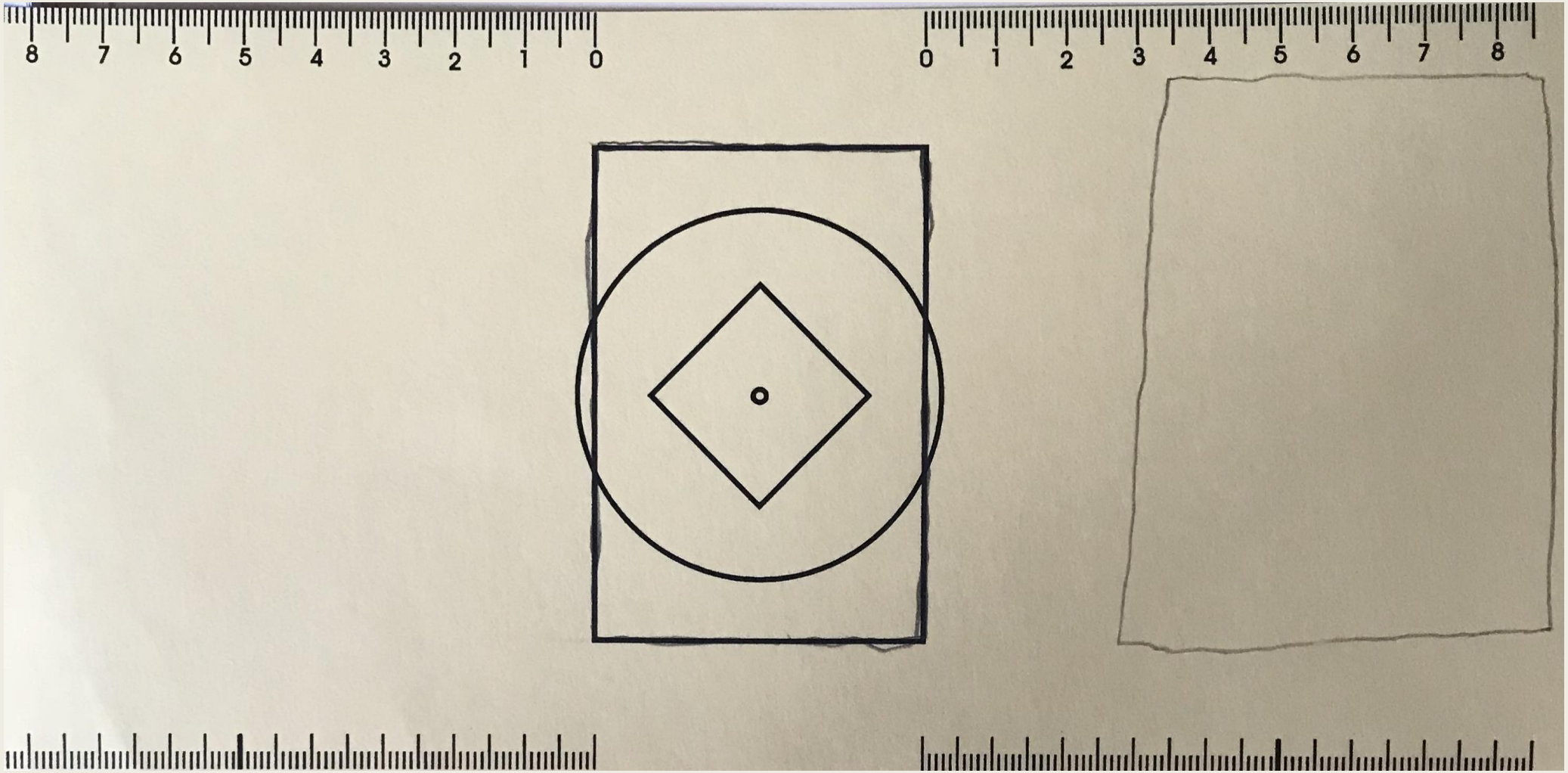
Visual Performance Evaluation – 4/12/2018

- D.E. (40 yr. old female) presented for a VPE because she has still been having diplopia, but not as much as previously. She is becoming comfortable driving again.
  - *Diplopia is horizontal side-by-side, some ghosting, daily diplopia (about 10-15% of the time), more common in the morning*
- 4^ esophoria at distance; 20^ alt int ET at near on cover test that broke down to LET
- Worth Dot: **2** @ 20 ft; **4** @ 15 ft; **5** @ 3 ft; **5** @ near; **5** with +/- 2.00 DS
- 20” arc stereo with Randot
- #7A: OD: -4.25-1.00x180 OS: -4.25-1.00x180
- #8: 16-24 eso #13B: 24 eso
- Dist. BI: x/ 6/ -2 Dist. BO: 16/ 24/ 18
- Near BI: 12/ 14/ 0 Near BO: 24/ 40/ 32 #20: -4.50 #21: -1.25 gross

Visual Performance Evaluation (VPE) – April 12, 2018



Visual Performance Evaluation (VPE) – April 12, 2018



Start in office VT – May 9, 2018

- Followed OEP CC grids…mainly VT1
  - *TBI and strabismus grids sprinkled in.*
  - *Emphasized peripheral awareness was especially helpful with Brock String*
  - *Talked about "relaxing" eyes to help with feeling divergence.*

- Progress checks after roughly every 8 sessions

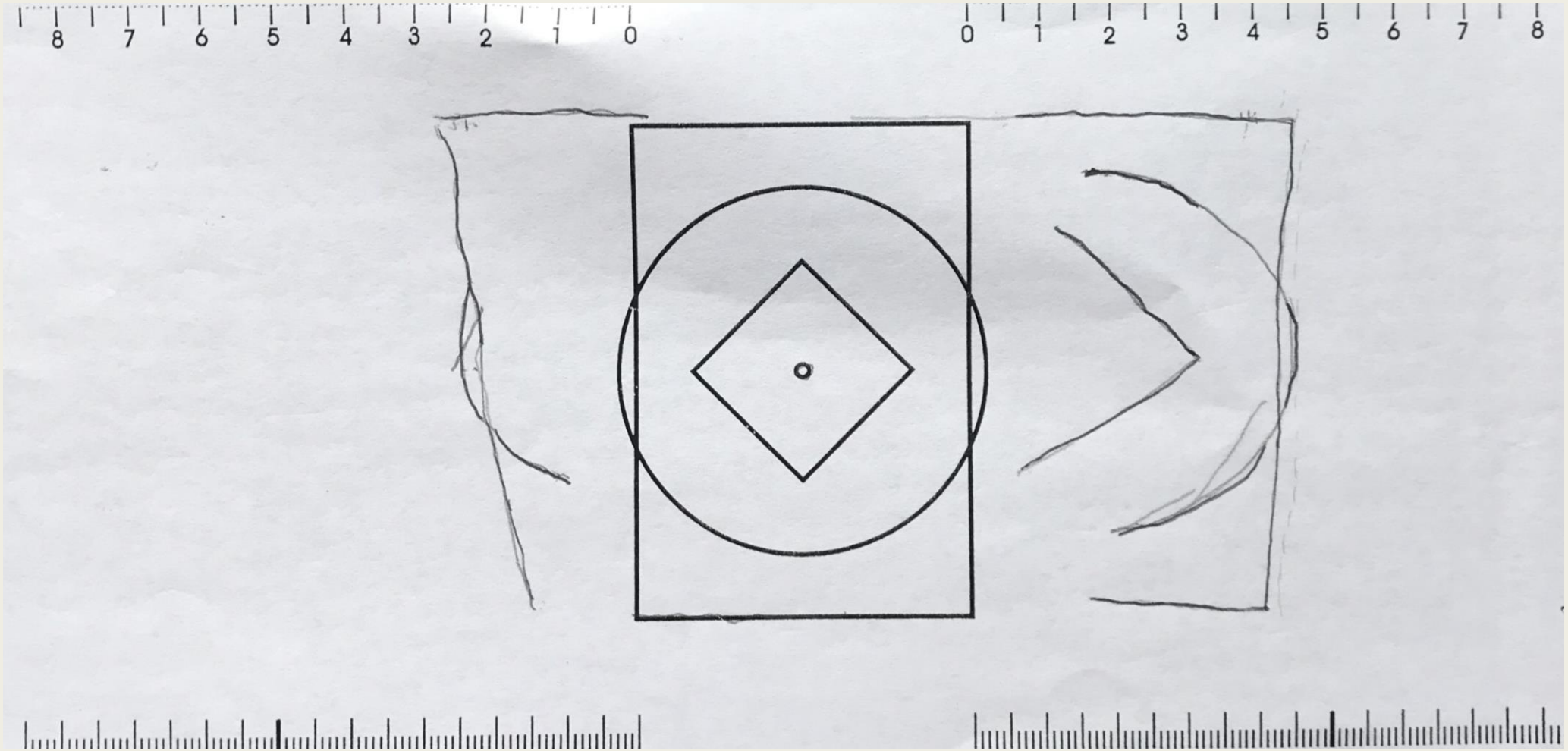
First VT progress check– July 18, 2018

- Has less diplopia, some in the mornings, but it disappears once she puts her glasses on.

- Ortho at distance breaks down to 4^ esophoria; 10^ esophoria at near
- Worth Dot: **4** @ 20 ft; **5** @ near; **5** with +/- 2.00 DS
- OS shows slight lag on EOMS, slightly jerky
- #7A: OD: -4.25-1.00x180 OS: -4.25-1.00x180
- #8: **4** eso #13B: 22 eso became 12 eso with +1.00 Add

- Dist. BI: x/ 8/ 0 Dist. BO: 32/ 36/ 24
- Near BI: x/ 16/ 11 Near BO: 32/ 32/ 14 #20: +3.00 #21: -1.00 Add

Cheiroscopic Tracing – July 25, 2018



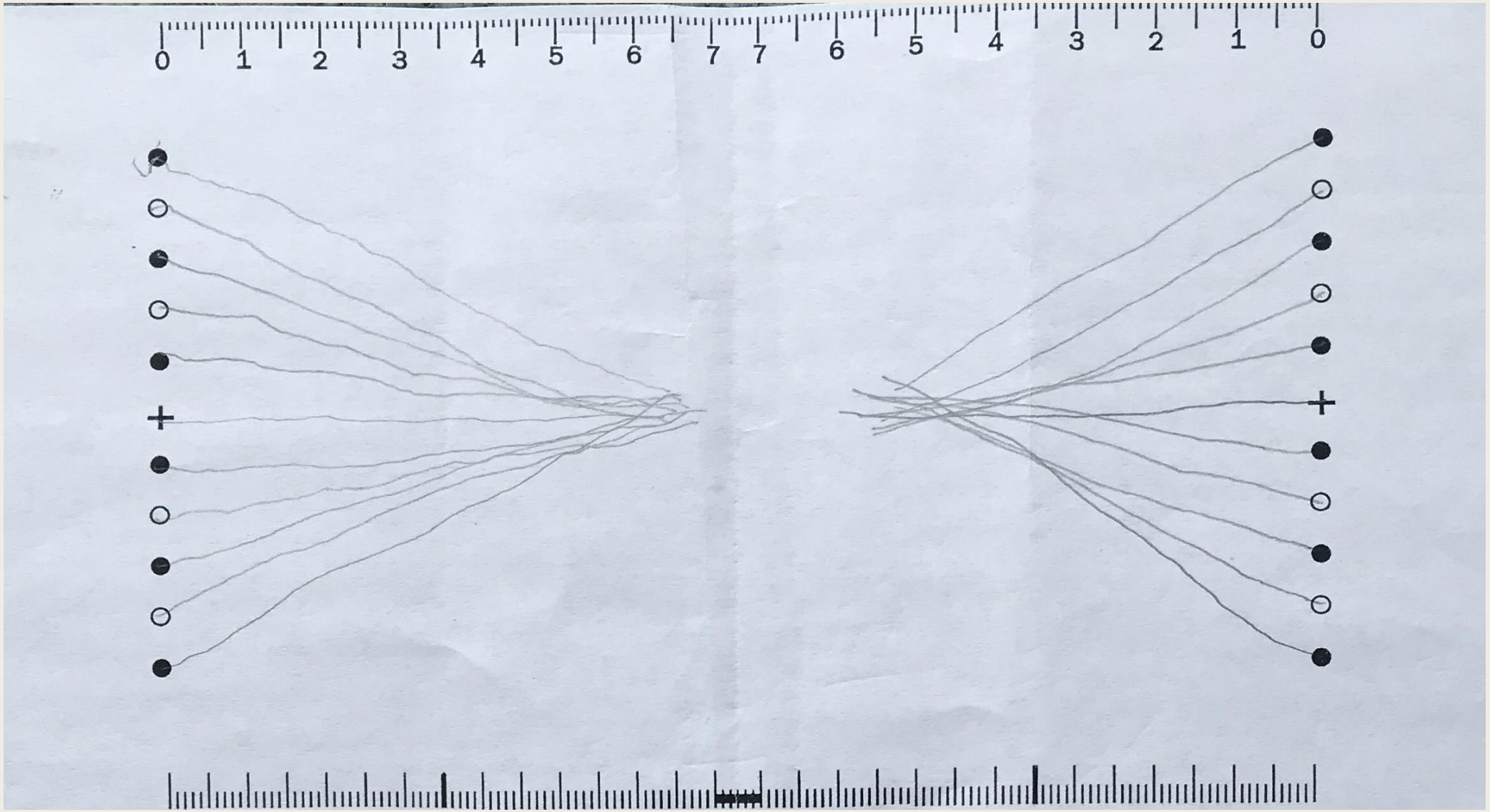
2nd VT progress check– Sept. 19, 2018

- Still some diplopia in the mornings, but it disappears once she puts her glasses on. Driving, but not 100% comfortable with vision yet. Less ‘strain’ with computer and near work.

- Ortho at distance breaks down to 4^ esophoria; 12^ alt ET at near
- Worth Dot: **4** @ 20 ft; **4** @ near; **5** with - 2.00 DS; **4** with + 2.00 DS
- Fair to Good EOMS; 20” arc Stereo
- #7A: OD: -4.25-0.75x180 OS: -4.00-1.00x015
- #8: **12** eso #13B: 20 eso became 18 eso with +1.00 Add

- Dist. BI: x/ 8/ -4 Dist. BO: 24/ 32/ 16
- Near BI: x/ 20/ 0 Near BO: 24/ 32/ 8 #20: +3.00 #21: -2.00 Add

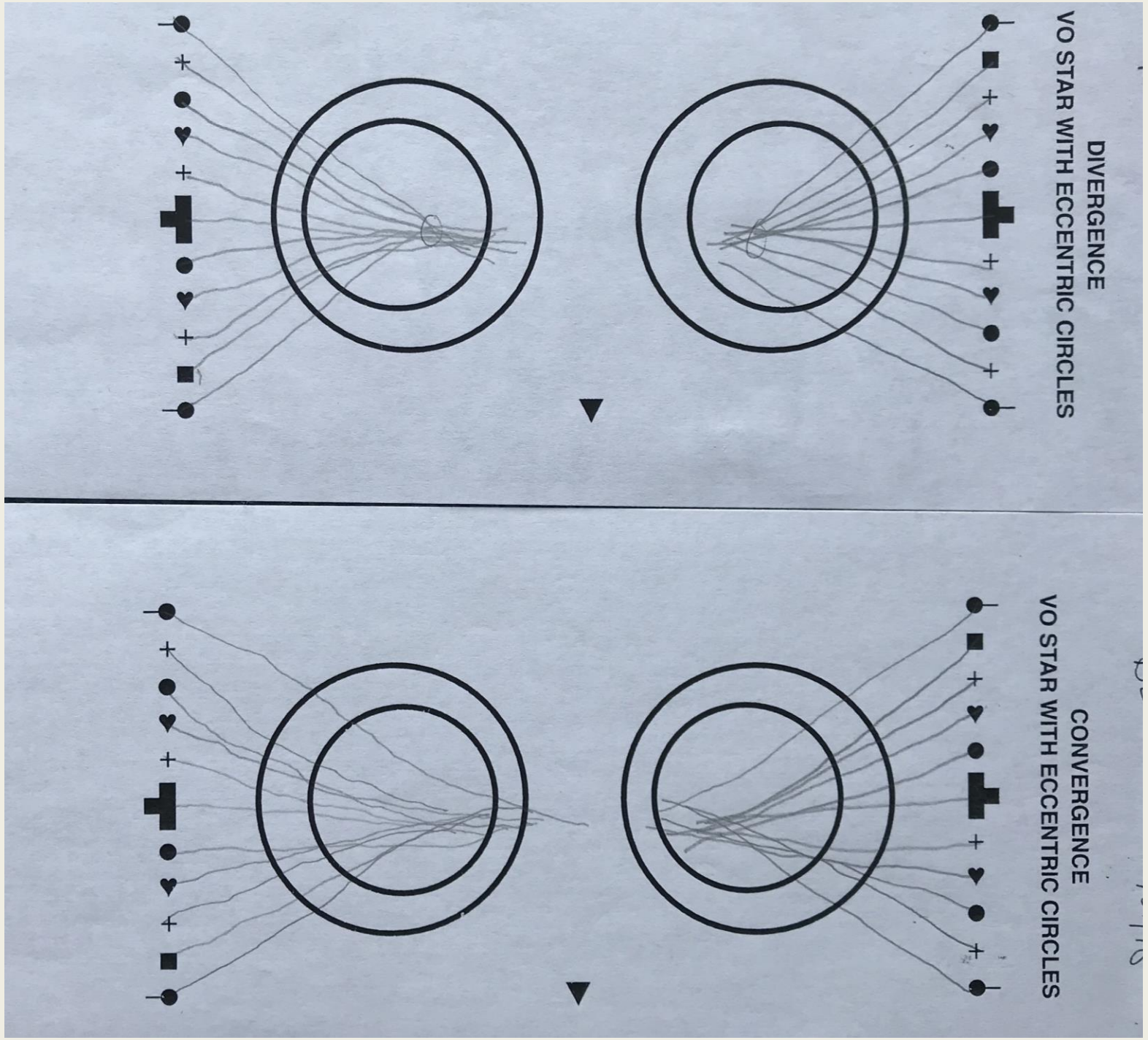
VO Star – October 17, 2018



VO Star

10/31/18

Graduated from VT 11/7/18



Follow up #1 after VT – 12/4/2018

- Still some diplopia in the mornings, but it disappears once she puts her glasses on. Driving, much more comfortable in life; Rare diplopia when tired.

- Cover test: 5^ esophoria at distance; 14^ EP -> alt ET at near
- Worth Dot: **4** @ 20 ft; **4** @ near; **5** with - 2.00 DS; **4** with + 2.00 DS
- Fair to Good EOMS; 20” arc Stereo
- #7A: OD: -4.25-1.00x180 OS: -4.00-1.25x180
- #8: **17** eso #13B: 25 eso became 22 eso with +1.25 Add

- Dist. BI: x/ 6/ -3 Dist. BO: 30/ 46/ 32
- Near BI: x/ 1/ -5 Near BO: 32/ 46/ 24 #20: +3.00 #21: -0.25 Add

A & P after 12/4/18 follow up

- Assessment: Esophoria: Stable symptoms, cover test, W4D, and stereo. BI equilibriums have slipped.

- Plan: Continue with current glasses. Recommended working on clear Lifesaver cards and Brock string at home, emphasizing periphery and divergence awareness. RTO 3 months or sooner prn.

- Thankfully CN palsy is rare in obstetric central neuraxial block (CNB) as only 43 cases were reported.[3]
- “More than 85% of post-dural puncture headaches will resolve within 6 weeks,”[4] but that statement seems to only consider the headache symptoms.
- “…Abducens, facial, and vestibulocochlear nerves [are] the most commonly affected” after CNB with the study finding a total of 43 cases affecting Cranial nerves II, IV, V, VI, VII, VIII, and X.[3]
- Most of the CN VI palsies resolved in < 3 months, but one was labeled permanent after 1 year and surgery was performed.[3]

- Hopefully surgeries for CN VI will be rare!

Questions?

Thank You!

References

1. Marr, R., A. Kapoor, N. Redfern. Epidural blood patch is the gold standard treatment for dural puncture headache; letter to editor. Reply: A. Fiala, E. Baumgartner, P. Paal. *Br J Anaesth* 2012; **109**(2): 288-9
2. Heyman, Harold J. MD, M. Ramez Salem, MD, Inessa Klimov, MD. Persistent Sixth Cranial Nerve Paresis following Blood Patch for Postdural Puncture Headache. *Anesthesia and Analgesia*. Vol. 61, No. 11, November 1982, p. 948-9
3. Chambers, D.J., K. Bhatia. Cranial nerve palsy following central neuraxial block in obstetrics – a review of the literature and analysis of 43 case reports. *International Journal of Obstetric Anesthesia. (2017) 31: 13-26.*
4. Fiala, A. Furgler G., Baumgartner E., Paal P. Delayed subdural haematoma complicated by abducens nerve palsy and cortical vein thrombosis after obstetric epidural anaesthesia. *Br J Anaesth* 2012; **108**: 705-6