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The following is the transcript of the 'Meet the Expert' on-line discussion session with Dr Harold Rekate, MD which was held in the Sir Victor Horsley Virtual Hall on 30 December 2008 at GMT 19:00 - 20:00 as part of the Fourth Annual International Neurosurgery Conference. (www.surgicalneurology.org/conf4)

Discussants:

Dr Harold Rekate, MD (Phoenix, USA), **Mr Owen Sparrow, FRCS** (Southampton, UK), **Dr Hakan Karabagli, MD** (Konya, Central Anatolia, Turkey), **Mr Guirish Solanki, FRCS(SN)** (Birmingham, UK) [*represented*], **Mr G Narenthiran, MRCSE** (Southampton, UK), **Aristotelis Filippidis**, MD (Larissa, Greece)

Mr G Narenthiran:

Hello Dr Rekate!

Dr Harold Rekate:

I am ready to begin. I have not used this type of format before so I am a bit rusty. Go a head with any questions.

Mr G Narenthiran:

Thank you very much!

Mr G Narenthiran:

Do you biopsy diffuse brainstem gliomas? There was a recent paper in British Journal of Neurosurgery arguing for this.

Dr Harold Rekate:

If they are truly diffuse I do not biopsy them. Over the past 2 decades the accuracy of radiographic diagnosis for these terrible tumors is very good and in my mind biopsy is not warranted. If you give me the reference I am happy to review it.

Mr G Narenthiran:

Reference: Leach PA, Estlin EJ, Coope DJ, Thorne JA, Kamaly-Asi ID. Diffuse brainstem gliomas in children: should we or shouldn't we biopsy? Brit J Neurosurg. 2008; 22(5): 619-625.

Dr Harold Rekate:

Focal tumor of the brainstem or exophytic tumors should be biopsied and if benign should be resected under neurophysiologic measuring.

Mr G Narenthiran: :

Patients with slit ventricular syndrome are continuing to be a challenge. How good has transverse sinus stenting been in your practice?

Dr Harold Rekate:

This is work in progress. For the patients with high ICP with non-responsive ventricles we have found high sagittal sinus pressures in all of them. Of those we have found stentable lesions in about a third. This is definitely a work in progress.

Brian Owler and John Pickard have done many more for pseudotumor which is actually the same thing.

Dr Hakan Karabagli

I have question about Cerebellar Mutism ,

Dr Harold Rekate:

I have many about that.

Dr Hakan Karabagli

Does unilateral dendate nucleus infarct cause mutism?

Dr Harold Rekate:

I have never seen mutism from a unilateral lesion but I could see that it could happen. The Rome

people published an article on mutism from a spontaneous hemorrhage in the anterior medullary velum without surgery. I think that there is still much to learn.

I think that the best experimental evidence comes from the functional literature from Italy. They had mutism after bilateral stereotactic ablation for spasticity. It was transient and much like our reported cases.

Mr G Narenthiran:

Do you use antibiotic impregnated VP shunts as a standard?

Dr Harold Rekate:

I do use antibiotic impregnated catheters at this point awaiting the unlikely possibility that there will be a controlled trial. It makes some sense.

Mr G Narenthiran:

Is there any controlled trial being undertaken to your knowledge?

Dr Harold Rekate:

I don't think so. After the no significant result in the shunt design trial I think that it will be very difficult to do one.

Dr Hakan Karabagli :

How about Dandy Walker Syndrome ? Best management= ETV+cyst fenestration at the same time

Dr Harold Rekate:

I have changed my management of DWS over the past decade. If they come in as babies I do a ventricular shunt with an endoscope and look at the aqueduct. So far it has always been open and I just do a ventricular shunt. At the time of failure If the ventricles expand I would do an ETV and test flow into the posterior fossa with iohexal. For really difficult cases I will do a posterior fossa exploration and consider putting a catheter from the fourth to third ventricle like Claude Lapras did. In one case the child continued to have high pressures requiring an LP shunt

Mr G Narenthiran:

Intramedullary ependymomas and radiotherapy. Do you treat any of your patients with radiotherapy after surgery

Dr Harold Rekate:

There seems to be demonstrable differences between fourth ventricular and intramedullary ependymomas. Spinal intramedullary ependymomas are pure surgical diseases whereas it is necessary to give focal radiation to the fourth ventricle.

Mr G Narenthiran:

Conus/cauda equina ependymoma?

Dr Harold Rekate:

This is something with no good answer. If they can be removed in total you don't need XRT but if not they can metastasize by CSF axis. I really don't know the answer.

Dr Hakan Karabagli :

Syringomyelia mechanism. Dr. Saffet Mutluer's question to you when ISPN congress time. Did you remember Hal?

Dr Harold Rekate:

I gave a talk to the Syringomyelia Society in Rugby, Englad 2 years ago. Syringomyelia is not one condition but many different ones. Shizuo Oi is correct that it is hydromyelic hydrocphalus in most cases.

As to the problem of syringomyelia, I don't think that this forum gives sufficient abilities to deal with this complicate subject. CSF can come from the spinal subarachnoid space to the central canal at the time of systole. It can also be the result of blockage of the central canal and the csf comes as a byproduct of spinal cord metabolism like it does in the brain.

Mr Owen Sparrow:

Any tips for managing the high protein CSF associated with some optic pathway gliomas?

Dr Harold Rekate:

That's again a challenging problem. I think that I would start with a ventriculosubgaleal shunt and see if you can ride it out. If it still is not shuntable you will need to do a major debulking of the tumor to keep it flowing. I have had a significant number of ventriculogallbladder shunts which should be good for this indication. Finally in the early 70s there was a paper advocating a ventriculoureteral shunt and, hook the ipsilateral kidney into the other ureter.

Mr Owen Sparrow:

I recall a paper in Surgical Neurology about 25 years ago of fatal ventriculitis from bile reflux (after inadvertent placement of a peritoneal catheter into the gall bladder, so have been a bit wary of that procedure, despite more recent reports of efficacy.

Dr Harold Rekate:

I suspect that the valve was upside down in that case. I have not seen that happen. We have had one case of chemical peritonitis secondary to leakage of bile around the insertion site in the gall bladder and now sew it over a metal connector.

Mr Owen Sparrow:

Thanks.

Mr G Narenthiran:

Mr Solanki asked me to ask you few questions on his behalf.

(**Mr Guirish Solanki**): What would be your indications to consider LP treatment of Closed Head injury?

Dr Harold Rekate:

Children with ICPS sustained in the high 20s or thirties with all standard treatments already attempted except barbiturate coma which we don't use anyway. I would say that it would be an alternative to hemicraniectomy. We have found open cisterns on CT scan on all patients treated in this way.

(**Mr Guirish Solanki**)

I would like to ask about the use of ICP monitoring in severe cases of meningo-encephalitis. The general data coming out of the US is that there is no significant improvement in mortality or benefit but data from Sweden suggests otherwise.

Dr Harold Rekate:

I have inserted EVDs on occasion particularly when it became a loss-loss situation no matter what you did (pupil dilatation). EVD allows "safe" CSF collection and ICP monitoring and improvement in compliance when brain swelling is a problem.

I have not seen the Swedish data and need to see it. I have found that if someone with severe bacterial meningitis has high ICPs they are treated here early with steroids but we go no further. Our results have been pretty dismal.

Mr Owen Sparrow:

How young would you go in considering a decompressive craniectomy?

Dr Harold Rekate:

I don't do them at this point. I am continually reviewing the literature and believe that there is a major attempt to do a randomized control trial. That would truly be useful

Owen Sparrow:

We get considerable pressure from paediatric intensivists here, so a decent trial would be really useful

Dr Hakan Karabagli:

Pineal mass and hydrocephalus at the same time in a patient.; during endoscopic procedure which one first to do ? biopsy first or 3rd ventriculostomy first?

Dr Harold Rekate:

Since the most important thing to do right away is control the hydrocephalus I would do the ETV first and then go and do the biopsy. Very little risk of bleeding from ETV but it is not trivial in the biopsy depending on cell type and you may have trouble seeing what you are doing.

Mr G Narenthiran:

Do you monitor brain oxygen tension in paediatric patients with head injuries at the BNI?

Dr Harold Rekate:

I don't measure brain oxygen in these patients but as I get older the number of head injured children I see has gotten less and less as I have primarily an elective referral practice.

Dr Aristotelis Filippidis:

Dear Dr. Rekate,

It is a great opportunity and honor to have the expert in the field of CSF dynamics and Hydrocephalus in this virtual room in order to stimulate the debate in the field.

For several decades the doctrine of CSF production via the choroid plexus and its absorption via the arachnoid villi to the cerebral venous sinuses had remained widely accepted. During the last fifteen years, however there were a few reports describing the presence of a functional and anatomical connection between the extracranial lymphatics (especially nasal submucosal and cervical lymphatics) and the subarachnoid space via the perineural spaces and the cribriform plate. Zakharov et al., proposed that this communication is the main mechanism of CSF absorption in sheep when intracranial pressure is within normal range while the elevation of pressure activates an additional route of absorption via the arachnoid villi that act as pressure valves. Studies in humans have also proved the existence of this communication (Johnston et al). Li et al, demonstrated in 1996 the presence of meningeal stomata (the term resembles diaphragmatic lymphatic stomata) by using scanning electron studies. The exact role in CSF turnover of this communication in humans stimulates a debate established under various intracranial pressure scenarios but it seems to play a role in CSF absorption.

Apart from anatomical observations that imply a functional role for the cranial subarachoidal space (CSAS), there is new evidence concerning electrophysiological data. Our team studies the electrophysiological profile of CSAS in a sheep model and revealed evidence about the presence of sodium-potassium-ATPase in arachnoidal and pial layers and the presence of ion turnover (Filippidis et al). The existence of such a pump with a possibly higher presence in the arachnoidal than pial surface, as data indicate, could possibly demonstrate a volume-regulating role of CSAS since sodium molecules osmotically drag water molecules.

Bergsneider et al in 2006 gathered questions that need answers concerning hydrocephalus and CSF dynamics. In a recent paper of yours (Rekate et al) you indicated the importance of CSAS and you argued about the raising concerns.

1) Do you believe that the role of lymphatics has a place that should be considered in the dynamics of your proposed model of CSAS CSF flow ? Could a theory of an intracranial lymphatic level of obstruction possibly interpret observations of CSF circulation pathologies ?

2) Do you believe that CSAS may play a more active role in CSF absorption (apart from the arachnoid villi outflow) or even production from meningothelial cells or pial vessels ?

I would like to thank you in advance and wish you Merry Christmas and Happy New Year from Greece!

Dr Harold Rekate:

You bring up some important and complicated questions. I am aware of the evidence that a large percentage of the CSF absorption is via the lymphatics and alternative pathways. What I can tell you with the work we have done is that the system works as if there is a slit vale between the cortical subarachnoid space and the superior sagittal sinus with an openning pressure of 5-7 mmHg. Johanson and others suspect that the pathway is through the lymphatics but eventually get to the SSS and that is the controlling mechanism.

Hope this helps

Mr G Narenthiran:

Do you operate on children with brainstem cavernoma?

Dr Harold Rekate:

Yes I do. These are challenging but the results have been generally good with what Spetzler calls the two-point approach. He puts a dot in the middle of the cavernous malformation and at the edge closest to the surface and that is the trajectory that is followed. It is simple and brilliant.

Mr Owen Sparrow:

Just thank you for your participation, for taking the time!

Dr Hakan Karabagli:

I appreciate Hal. Please pass our best wishes your family Hal.

Dr Harold Rekate:

Definitely my pleasure. Happy New Year to all and hope for a better world for everyone.

Mr G Narenthiran:

If Dr Harold Rekate permits, I can publish the transcript of our wide ranging discussions on the mailing list and web this will be very useful reference.

Dr Harold Rekate:

No problem I am honored to be asked.

Mr G Narenthiran:

Thank you very much indeed Dr Rekate!

Tudor House, Southampton