

Dr. Garret Choby:

Hello there, and welcome back to another episode of ENT in a Nutshell. I'm your host Garret Choby, and today, we are joined by two special guests, Dr. Maria Peris-Celda and Dr. Carlos Pinheiro-Neto. Dr. Peris-Celda is a fellowship-trained skull-based neurosurgeon, and Dr. Pinheiro-Neto is a fellowship-trained rhinologist and skull-based surgeon within otolaryngology. Thank you so much for joining us.

Dr. Peris-Celda:

Thank you very much.

Dr. Pinheiro-Neto:

Thank you, Garret. It's a great pleasure.

Dr. Garret Choby:

Absolutely. So today, we have a really interesting topic and we're going to be discussing olfactory groove meningiomas. This is a really interesting topic because it's truly at the interface of the neurosurgical and otolaryngology specialties. In an area where we do a lot of work together in team-based surgery. I thought it'd be a very nice topic for us to discuss, and you guys have a lot of great expertise and interest in this area, so I thought you'd be a great set of guests to help us understand this disease process and how we may treat it. The first thing that we always like to talk about with this disease is when a patient comes in to see you, what are the typical presenting symptoms that patient may have?

Dr. Peris-Celda:

So for olfactory groove meningiomas, which are midline meningiomas in the anterior skull base around the cribriform plate and the crista galli, sometimes, if they arise just from that area, it's sometimes very difficult to have a clear presentation. A lot of the times, they are of really great size when they present with personality changes, for instance, when they produce or they cause edema bilaterally in the frontal lobes, and usually for that, they are greater than four centimeters. Anosmia is another symptom that is quite common, although sometimes, it's not usually the primary complaint, but when the patients present with a large olfactory groove meningioma, when they are asked about that specifically, they usually report or they often report this symptom.

Then when the tumors grow usually along the planum sphenoidale as well, and posteriorly, they can also cause visual acuity problems, visual field deficits, if they displace the optic nerves and the chiasm. There's also another presentation that is very classical for this olfactory groove meningiomas, which was described as a Forster Kennedy syndrome, which is rare to see but it causes with unilateral optic nerve atrophy and contralateral papilledema.

Dr. Garret Choby:

Interesting. You mentioned early on that occasionally they'll present with some personality changes from frontal lobe edema, and that typically frontal lobe symptoms or what personality changes might they experience?

Dr. Peris-Celda:

The family members usually detect that before the patient does, suddenly can cause with anhedonia, or lack of interest in certain things, and even depression, and also some cognitive changes as well.

Dr. Garret Choby:

Very good. As far as far as what's been described, are there any specific predisposing or risk factors for these meningiomas?

Dr. Peris-Celda:

So, meningiomas, intracranial meningiomas, we have usually they are sporadic and they present around with people under 60s or 50s, most usually, but also some genetic diseases such as NF2 and other syndromes and also exposure to ionizing radiation in the past is a predisposing factor. So, those are probably the most important and also hormonal component of meningiomas, but sporadic tumors are the most common.

Dr. Garret Choby:

And when we talk about these particular tumors and how they develop, in a little more specificity, can you tell us where these tumors develop so we know they can occur in different areas but specifically in olfactory groove in different areas of cranial base, where do meningiomas arise from?

Dr. Peris-Celda:

So they arise from the cells in the arachnoid. And so, they have a dural base, and that's what defines meningiomas. And specifically, when we talk about olfactory groove meningiomas, they arise from the area around or dura around or in the olfactory groove, and cribriform plate, but also around crista galli, and then posteriorly, when they go to the area of the planum sphenoidale, they are called planum meningiomas. And often, the meningiomas involved these two areas if they are large enough.

Dr. Garret Choby:

Very good. Just for the audience, can you talk a little bit about the spectrum of this disease? So we typically think of meningiomas as not a malignant tumor but there is certainly a spectrum there. So we've talked about a grade of tumor and how that is described.

Dr. Peris-Celda:

Yeah. So there's so many meningiomas. The World Health Organization divides them in three types or three grades. The grade one which is the most common, which is about 80 to 90% of the cases, which is the histologically most benign tumor with the lower recurrence rates. And then the grade two, which is also named as atypical meningioma. Then the most malignant or the most aggressive locally is the anaplastic meningioma, which is grade three. So there are current rate of the those tumors even after grade total resection is much greater, especially in the grade three as compared to grade one. But they are also less common.

Dr. Garret Choby:

Very good. If you have someone that comes to see you in clinic with a large midline tumor in this particular location, perhaps some of the symptoms you mentioned earlier. Is there anything else on your differential that you would consider besides a meningioma?

Dr. Peris-Celda:

Yes, so the imaging is quite typical, although there are some other pathologies that can mimic this presentation in MRI or CT scan. And one of the most common and that we have to ask the patient

about, any past medical history is specifically, any history of previous cancer, previous malignancies, because any dural metastasis can mimic the appearance of meningiomas. So even small lesions that look like meningioma in patients with history of cancer, they have to be watched very carefully. And also lymphoma is the another great mimicker as far as dural-based lesions, also hemangiopericytoma and of course, inflammatory and infectious diseases can enter in the differential. So really, a thorough history of the patient in clinic is very important to direct and to suspect these diseases as well.

Dr. Garret Choby:

Very good. And this is sort of leads into the next area that I was hoping you would be able to discuss, because this is probably a very key part of this conversation. It's the imaging characteristic of these lesions in what they tend to represent on both MRI and CT scans. And it really is important to have a good idea of what you're dealing with prior to offering the patient a certain intervention. So perhaps, you could speak to those imaging characteristics of these meningiomas.

Dr. Peris-Celda:

So in CT scan, the meningiomas and also in MRI, usually they enhance with contrast. So that's a very typical dural-based lesion that enhances with contrast. That's very typical. Without contrast, we can see some isodense or hyperdense images on CT scan. And in MRI without contrast, they can vary from iso to hypointense in T1, or iso or hyperintense in T2 for the most part, but commonly in CT and MRI, they have this usually homogeneous enhancement. Sometimes they are cystic parts as well, and what is very typical is the dural tail, which is enhancement that diminishes around the sides or the limits of the meningioma, and that's why typical.

There are reports of non-enhancing meningiomas, but that is exceedingly rare. And also another characteristic that I would like to say about meningiomas is that sometimes, they are calcified. And that can be seen very well, especially in CT scan. And that's very characteristic of meningiomas when that happens, which are the minority of them. But that is a good sign that usually differentiates them quite often from other pathologies. And then, also is very important regarding vascularization of these lesions. We can get CT angiograms, for instance, or angiography, just to determine also the encasement and the vascularization of the lesions, which is also very important.

Dr. Garret Choby:

Yeah, absolutely. And Dr. Pinheiro-Neto, I wonder if you might speak to a little bit of a lesion in this area, we can either see an intracranial lesion that could potentially extend into the nose, versus other lesions that begin high in the nasal cavity, for instance, esthesioneuroblastoma, that may extend superiorly, intracranially. So how would you look at imaging studies of these lesions? What helps you to differentiate those things?

Dr. Pinheiro-Neto:

Yes, so when the tumor has this large dural base, and going usually through the cribiform and filaments towards a nasal cavity, that's most likely represents a meningioma. Usually when it's a tumor, that it's more concentrated in the nasal cavity and push the skull base superiorly, you can see this round shape of this lesion expanding towards the skull base. In the case of esthesioneuroblastoma, usually we don't see these tail, the meningioma, the dural tail like we see in the meningiomas.

Dr. Garret Choby:

Very good. And then, I wonder before we get on to different interventions or treatment options, I wondered if you guys might be able to speak to pertinent physical exam findings that are available for these patients. And perhaps also, if you elect to do a nasal endoscopy on these patients, perhaps for surgical planning, what particular things you look for on your endoscopy that may help you to plan a surgery?

Dr. Peris-Celda:

Yes, so interesting that when we're dealing with a patient with an intracranial tumor, and the recommendation is a endoscopic transnasal approach, it's intracranial disease that we're using this sinuses as a pathway. So, it's important to see if there is any deviated septum, any sign or nasal pathology associated because sometimes a patient can have the meningioma and recurrent sinusitis or chronic sinusitis, nasal polyposis. So, it's really important to perform a nasal endoscopy before the surgery, not only see the images, CT scan and MRI, but also see the quality of the nasal mucosa presence of pure lens, deviated septum that can be in your way to reach the skull base. So it's important to perform our nasal endoscopy before the surgery in a clinic.

Dr. Garret Choby:

Very good, thank you. And I think we'll change gears a little bit now and talk about treatment options. So I would imagine, Dr. Peris-Celda, that these patients are probably seeing you primarily in clinic as their initial surgical contact point. So, I was hoping you'd be able to give us a synopsis of the initial conversation you have with these patients in regards to treatment options that are available to them to consider.

Dr. Peris-Celda:

So first of all, depending on the symptoms and the size of the tumor, the recommendation could be just, if it is incidental, and the tumor is small, the recommendation may be just follow up with an MRI. But when we have large tumors or symptomatic tumors or tumors that we have been watching carefully and they present with growth at some point, then we have several treatment options. We have either surgery and surgery is preferred for tumors that are large tumors, that they present with symptoms because of compression. At that point, we have in surgery, two surgical options, either to do a craniotomy and resect the tumor, or if they are minimal, we can do an Endoscopic Endonasal Approach. There's a role for stereotactic radiosurgery as well, for especially, [inaudible 00:13:25] base or Gamma Knife based, etc, as primary treatment, which is usually reserved for either patients who are elderly or have comorbidities, and they have also relatively small tumors, usually less than two, or 2.5 centimeters in these patients.

Some groups say that these could be even if the patient does not have anosmia, could be a way to also preserve smell. But there are limitations, such as small volume, and also if it's close to the optic nerve or optic chiasm, would not be the ideal treatment, and also some adverse effects of radiation. So for other patients who don't have these characteristics, we think about surgery. And it's really important to make a good decision about the approach depending on the particular patient, comorbidities, tumor size, location of the tumor, and the structures involved. And also, another important data to have in mind is also how comfortable we are with one approach or another approach. And how is the team that we have to perform one approach or the other?

Dr. Garret Choby:

Yeah, absolutely. I think those are all really important points to make as you think about those things. But before we get too far into the surgical aspects, I just wanted to ask a quick question on Gamma Knife therapy. It's something that we see given a fair amount, especially for smaller tumors, or perhaps an elderly patient, is the goal of gamma knife to simply stop growth of tumor? Does it make it go away? How's it actually work? And what are we trying to accomplish with Gamma Knife therapy, if that's selected as an option?

Dr. Peris-Celda:

Yeah, so if try to accomplish [inaudible 00:15:29] of the tumor, sometimes we even see the tumor shrink a little bit, but it will not disappear. So the benefits is that is not as invasive as surgery, and also has more than 90% control of the tumor that has been recorded in about five years after treatment, especially for tumors that are grade one. It also has been seen that in the patients that who have preserved olfaction, that usually preserves olfaction after this treatment. So it's also a great tool, a great option, as well for patients and certainly in the right subset of patients and tumor size and proximity of structures is a very important treatment to offer as well.

Dr. Garret Choby:

Very good. Thanks for clarifying that, especially for the otolaryngologist in the audience. It's nice to have a little background on those treatment options that are primarily used for neurosurgical indications. So let's move on and you touched a little bit on surgery already and brought up some excellent points about different options that are available and how you may begin to think about those things. Let's presume that you're in a situation where both a craniotomy approach and an endoscopic approach are both very capable options at your institution, talk with us a little bit about when you go through that process with a patient of deciding which option you're going to choose, what factors really play a strong role in deciding?

Dr. Peris-Celda:

I usually talk to the patients about if they're both equally, meaning, we think that we can get the same degree of resection with open and endoscopic approach, then comes a matter of, number one, patient preference; number two, the presence or not of anosmia in patients who have olfactory groove meningiomas. Why? Because in open craniotomies, we are sometimes able to preserve olfaction; whereas, when we go through the nose, we go through the olfactory epithelium to the lamina cribrosa, and we cannot preserve olfaction. So that's one of the main points. And then, the other point also is that, of course, the craniotomy means a larger incision, and some patients just prefer an endoscopic approach. But the most important factor has to be if we are able to... We have to choose the approach or recommend the approach that we think is going to get the best degree of resection.

Dr. Garret Choby:

Very good. And let's say that either from patient preference or from share decision making you elect for a craniotomy approach, what exact approach would you typically select, and in that approach, what would you typically consider for your reconstruction.

Dr. Peris-Celda:

So I select the approach based on the attachment of the tumor, because sometimes, the tumors are very large, and they can, not only olfactory groove meningiomas, but also sphenoidale planum, [inaudible 00:18:45] tuberculum, sphenoidale one or the other optic canal. And so, if they're purely

olfactory groove meningiomas, meaning they are completely midline, and they don't extend to the optic canals on one side or the other, they are not around the carotid artery or encasing that, then I would say, I usually prefer to do pterional approach, that's a frontal approach. Because by doing that, we can also dissect pituitary before, and coagulate the vascularization of the tumor early, and then, we know that the optic nerves and the chiasm are going to be posterior to the tumor.

However, when these tumors are very large, and they they are also in the planum, and going towards the tuberculum, and especially when they are going to towards one or the other side, and invading the optic canal and are around the carotid artery, then I usually prefer to perform either Pterional approach or Orbitozygomatic approach, depending on how high the tumor is. If the tumor is very high, I usually use Orbitozygomatic approach. And the reason for that, to use the Pterional or Orbitozygomatic, as opposed to the Bifrontal approach in these cases is because I can perform anterior clinoidectomy, find the carotid artery, and also compress the optic canal and open the falciform ligament. But when it's a purely of olfactory groove meningioma, at least in my opinion, is usually more advantageous to go sub-frontal, because then, you can also coagulate the base around the cribriform plate better than when we go through the side, because it's very deep into the anterior cranial fossa, as well.

Dr. Garret Choby:

Very good. Now, one more point on the craniotomy. An aspect you mentioned earlier about the potential preservation of olfaction is something that we discuss a lot when we think about the endoscopic versus a craniotomy approach. Can you talk a little bit more specifically about techniques to preserve that in a craniotomy when possible?

Dr. Peris-Celda:

Yeah, so the ways to preserve that is to preserve the olfactory nerves, the olfactory bulbs, the filaments, and preserve the structure that go into the nasal cavity from the small filaments that go into the nasal cavity. So sometimes, the tumor when they're very large, and they involve these areas, this is part of the dura that we have to take out. And so, in very large tumors, the patients, they often don't have any sense of smell. But at least when they have some preservation of smell, at least, leaving one of the sides with the olfactory nerve, and filaments intact, will preserve olfaction. And so I think that's important, too. It's a very important point for consideration.

Dr. Garret Choby:

Yeah, absolutely. With this approach, whether it's a Bifrontal or an ozy, or whatnot, how often do you encounter a CSF leak into the nose? And if so, what do you typically use to reconstruct that?

Dr. Peris-Celda:

That's a very important point. So the resection rate is very important in meningiomas. We, being seen some great one, the resection that we want to accomplish, which is all the microscopic tumor that we see, the dura-involved and the bone-involved. And often, we have hyperostosis of the bone, and often we have infiltrated bone. So when we drill the bone and then we encounter that bone is involved and we are in the nasal cavity, then if it's a small entrance into the nasal cavity, and we can pack it with either fat or muscle, but it's very important to close the door as tightly as we can.

If it's a large area, to reconstruct, we use fascia ladder, suture primarily. And we also use the pericranial flap as well. Often times, we need to cranialized the front of sinus, because we want to really get when we do Bifrontal craniotomy, one to really get low into the anterior skull base. So we can have

access towards the base of implantation of the tumor. And so for that, we have to remove all the mucosa of the front of sinus, drill at least most of the posterior table of the sinus and then we usually pack with fat, and we use the pericranial flap on top of that.

Dr. Garret Choby:

Now, on the contrary, if you decide a patient may be amenable to an endoscopic approach, I always find it interesting to discuss with folks about, what are the limits of the endoscopic approach? So in other words, if you have a tumor, is size a limit, is degree of intracranial extension a limit, or perhaps degree of orbital involvement or overtop the orbit? How do you think about those things when deciding about an endoscopic approach?

Dr. Peris-Celda:

So I think one of the most important parts is the lateral extension. I think, even if it goes a little bit over the orbits, we are usually able to re-save that endoscopically, as long as it does not cross the limit of the medial aspect of the optic nerves, in the orbit. And so how we are going to reach laterally if it goes a little bit about the orbits, is a matter of resecting the lamina papyracea and going on top and pushing a little bit, the orbit, laterally. And so we can get to the base of implantation of the tumor, but that's certainly a limit for the endoscopic approach. Another factor to consider, and this is controversial, is when the tumors don't show a good arachnoid plane. Sometimes, it's a little bit more challenging to dissect from below than through the craniotomy, and so, we can see that usefully in the T2 sequences in MRI. And also when we have arterial encasement, if the tumor is very large and has arterial encasement, although not all the groups would agree with this. I think it's a little bit more challenging to perform that through the nose.

Dr. Garret Choby:

Yeah. And in particular, which arteries would you be most concerned about for a tumor in this location?

Dr. Peris-Celda:

So, the ACA branches, that would be the most concerning, and then if the tumor is very large, it can really go... It has that tuberculum sellae component, then it can go all the way back and involved all the other perforating arteries. So if this is the case, tumor also involves the tuberculum, then is challenging no matter which approach we choose, that's for sure. But if there's true arterial encasement, it is usually a little bit more challenging to perform the dissection through an endoscopic endonasal approach.

Dr. Garret Choby:

Yeah, absolutely. Dr. Pinheiro-Neto, I wonder if you could talk a little bit about if... You guys are planning for a combined endoscopic surgery. How do you think about the nose in the corridor to access this tumor? And what are your thoughts as you plan out your portion of the operation?

Dr. Pinheiro-Neto:

Yes, so to use the nose as a corridor to remove an intracranial tumor, the ideal scenario is to minimize as much as possible the nasal trauma and preserve the nasal physiology. So at the beginning, when we started doing those approaches, we were removing all the middle turbinates to complete anterior/posterior ethmoidectomy, maxillary antrotomy, just to create space for the neurosurgeon to really resected tumor. The natural evolution of those approaches now is try to minimize a nasal trauma if we're dealing with the only intracranial pathology. So in our group now, what we do is we call the



superior ethmoidal approach, where the beginning of the operation is a Draf III frontal sinusotomy to create space in frontal sinus and exposure of the posterior table of the frontal sinus is the slope of the skull base, keeping the middle turbinates attached. And from there, we lateralized the middle turbinates and work in the space between the nasal septum, and the turbinates, just removing the cells along the skull base towards the orbit.

And these work is performed bilaterally, very limited superior septectomy is performed, just along the next to cribriform. So, that's more or less the approach we are doing now for those tumors. When we have that space and remove the skull base bone, the space is pretty much the same, as a little bit more restriction doing the nasal work. But the intracranial work is pretty much the same. There is no compromise of the degree of resection of the tumor. And we recently studied the physiology of this, which showed in a computational fluid dynamics study, that showed the more preservation the ethmoid, the nose postoperatively, it looks like more the normal nose with a similar airflow and heat transport to the nasal cavity. So I think there's a new trend now, for intracranial pathology, using those only as a corridor.

Dr. Garret Choby:

Yeah, it's a great point. And I think you guys have done some really nice work on this and leading the way in these truly minimally invasive approaches. Would you also touch a bit on how you think about reconstruction as you've planned the surgery? Typically, in most of these cases, as opposed to sinonasal malignancy, the nose is a little bit more... It gives you a few more options than big tumor in the middle the nose. So how do you think about and plan your reconstruction, for intracranial pathology?

Dr. Pinheiro-Neto:

Yes, so the best reconstruction is using vascularized tissue. Especially if you're dealing with a large anterior cranial base defect. In our group when we're doing with areas, not large defects, not a high flow CSF leak, free mucosal graft work very well. But when you talk about the large anterior cranial resection bilateral, the best reconstruction is with a vascularized flap, the first option, the nasal septal flap. It's very important to discuss all the options prior and discuss with the patient. Because if there is a possibility of the need of a pericranial flap, for example, even in endoscopic resection, this patient needs to be consented, he needs to know that you might have a incision in the cranial area.

Also, preparation of the surgical field before the surgery. So I think this is a very important topic, because the patient needs to know. And you need to know how to approach that and have options for the reconstruction because sometimes, you have the [inaudible 00:30:20] flap, the flap is not enough to cover the large skull base defect. And you need to have other options, quadrilaterals flap or lateral nasal wall flap, or maybe even the pericranial flap to be transposed into nasal cavity.

Dr. Garret Choby:

Yeah, very good points. I think, having proper preparation for the surgery is really key for these approaches. And Dr. Peris-Celda, I wonder if you might talk a little bit about advantages or disadvantage of the endoscopic approach in the sense of approaching the tumor directly underneath, where its primary attachment point is, versus approaching from above. And if there's any benefit or drawback to either of those approaches?

Dr. Pinheiro-Neto:

Yes, that's a very important point. One of the biggest and greatest advantages of the endoscopic endonasal approach for olfactory groove meningiomas, there's no question about is that the vascularity



of the tumor, or at least the main vascularity of the tumor, through the anterior and posterior ethmoidal arteries, is seen first and is correlated first. That means that the tumor is the vascular eyes to a greater degree. Whereas, if the tumors are very large, and we go also from as a front approach, although we try to go epidurally, and first coagulate the base of implantation of the tumor, is certainly not the same. We don't get the same degree or the vascularization as going through the nasal cavity, which we see the anterior and posterior ethmoidal arteries. But the technique is the same, the concept is the same. But I would say that the efficiency of the vascularizing the tumor that way is greater with the endoscopic approach. And that's a great advantage of that.

Dr. Garret Choby:

Thank you. An as we talk about these approaches, it's also important to think about post-surgical care of these patients. So in these approaches, whether it's a craniotomy or the endoscopic approach, what are some complications you can see in the early post-operative period?

Dr. Peris-Celda:

So the complications, we are always worried about is CSF leak. That's the most important complication, of course, any hemorrhage or stroke, or anything intracranial. And then, when we go through the nose also, epistaxis could be a problem. But the most common complication, I would say, is probably the CSF leak, and different groups have looked at different series, and they all tend to agree that the endoscopic, endonasal approaches tend to have more postoperative CSF leaks than the open approaches just because with open approaches, we are able to directly suture the dura, we have different layers. But really paying attention to detail in endoscopic approaches, using the vascularized flap thinking about reconstruction before the operation, and it really minimizes the post-operative CSF leak, that has to be a goal of that surgery as well.

In our group, in endoscopic approaches, for these we place inlay graft. And that usually says synthetic collage engraft, if it's just the olfactory group involved, and then we put the nasal septal flap. But if we have a little bit more posterior defect involving the planum or a little bit the tuberculum, then we prefer to use a fascia ladder, inlay graft, sometimes placed as a bottom graft which has two layers, suture; one inlay, one onlay. And then, after that, we place a nasal septal flap. And I let the doctor Pinheiro talk about when we have a very anterior defect. Sometimes, Dr. Pinheiro releases the pedicled of the nasal septal flap so it reaches anteriorly towards the frontal sinus.

Dr. Garret Choby:

Yeah, good point. I think you have one or two very nice papers on that. Would you provide us little more detail on that?

Dr. Pinheiro-Neto:

Yeah, so for the reconstruction of the skull base, when you're dealing a very large defect, we need to optimize the reconstructive surface of the flap, which means that when we harvest a standard regular nasal septal flap, which is pedicled at the sphenopalatine artery region, and at the arch of the choana, there are all that mucosa, the periosteum of the mucosa, vomer it's basically used as a bridge, in the reconstructive area, the flap is mostly the quadrangular cartilage area in the front, which is a thicker area. If we do this release all the way towards the pterygopalatine fossa.

And in some cases, even the periosteal release, after opening the maxillary sinus exposure of the pterygopalatine fossa, a periosteal release around the artery, it's possible to extend this flap along the orbit and a more mucosa of the flap will be available for the reconstruction. So we are doing that.

Another thing that can be done at the extended dissection of the flap towards the floor or even inferior meatus. That area of the floor attached to the... Included to the regular standard nasal septal flap, it's very nicely to rotate in and cover the region of the tuberculum. So the quadrangular cartilage area of the flap goes anterior, and that area of the floor posterior towards the planum. So, it's a great coverage of the skull base, all the way from the tuberculum to the frontal beak.

Dr. Garret Choby:

Yeah, excellent. That's a really nice option for those, I think very large defects that you occasionally get with tumors such as this. And as we think about moving out longer term as this patient's progress, hopefully tumor free for one, two, three, four, 10 years. Any other things that you see as adverse effects that can come up along the way with these patients?

Dr. Pinheiro-Neto:

Yeah, long-term, especially if you're doing the endonasal approach, or a craniotomy approach by [inaudible 00:36:42], with frontal sinuses cranialization, it's important to get images not only to see the tumor, or any evidence of recurrence, but also to check the presence of mucous seals. So especially with the cranialization of the frontal sinus, if there is some mucosa trapped in the sinus that can progress your mucosal seal. So one of the most important things in the sinuses is check the presence of sinusitis, mucosa seals, and that's interesting, because sometimes the patients are completely asymptomatic. So the image is going to be important for that.

Dr. Garret Choby:

Excellent, thank you. And there's a couple of things I wanted to just quickly asked about that vary from groups of groups. I was curious as to how you guys do a few of these things. The first one is if you have a patient that you've done this approach on endoscopically, it has some packing in the nose. Do you typically like absorbable packing or non-absorbable packing? Do you typically utilize antibiotics?

Dr. Pinheiro-Neto:

Yeah, so that's very interesting. I've been changing over time. First, I was using non-absorbable packing for everybody. And now, for these large defects... And then they I start using just absorbable packing. Nowadays, my approach, our approach for if we're talking about a very large defect, is after putting a dura sealant over in this reconstruction, we place a absorbable packing first, sometimes two absorbable packings, because they are large defects and to support that, a non-absorbable packing. But what's interesting is, when we're dealing with... When we're able to do this preservation of the ethmoid. If you just pack the superior ethmoid space with absorbable packing, the remnants of ethmoid in the turbinates support the reconstruction. So if it's a... For example, we're doing this for a sinonasal malignancy, that the nose is totally empty, absorbable packing next to the reconstruction, and then two non-absorbable packing to support. And then a non-absorbable pack for four or five days. If it's a superior ethmoid approach, just observable packing to superior ethmoid space.

Dr. Garret Choby:

Yeah, very good points there. And then lastly for this area, if you've someone who has obstructive sleep apnea and who perhaps is on a CPAP machine, how do you counsel them about resuming that postoperatively?

Dr. Pinheiro-Neto:

That's a great question. So that's something that there is no consensus yet in the literature and always try first to talk the patient and see if they are able to... If there's not a very severe sleep apnea, patients are going to have a major problem, high risk if not using CPAP, if they can avoid a CPAP for two, three weeks. If not, they go back to using the CPAP after a week. So that's more or less usually the approach we have.

Dr. Garret Choby:

Yeah, great, thank you. We're seeing more and more folks who have sleep apnea or on CPAP machine, so I seem to encounter that question more and more. So thanks for offering your perspective on it.

Dr. Pinheiro-Neto:

Yeah, what I've noticed is, if you're doing the only skull base surgery, with more preservation of ethmoid, I feel that airflow is going to be more directed to the nasal pharynx. So it's going to be the CPAP. If the patient can stay without the CPAP for a little longer, that's the best, but sometimes they are not able. And if they're not able, you can even think to leave just the packing, next to the reconstruction but with an area for the airflow underneath.

Dr. Garret Choby:

And as we start to wrap up today, outside of particularly olfactory groove meningiomas, as a very successful group, any tips or tricks that you guys have come across to the years as far as building a practice or innovating as you guys have, or those kind of things, they'll be useful for the audience.

Dr. Peris-Celda:

So I think regarding planning an individual case, I cannot emphasize enough that we need to get the maximum information from the preoperative test, especially from the imaging, especially the MRI, the CT scan, because where the hyperostosis is, can tell you exactly where the tumor is attached, for instance, and that is going to be a major factor in evaluating where or how to resect the tumor. Meaning for instance, if the base of implantation of the tumor is in the planum versus a little bit posterior that is in the tuberculum, is a completely different operation in terms of risk. And if we talk about the endoscopic endonasal approach, and reconstruction, etc. So I think that's a major factor. And also, as far as I think having a multidisciplinary team greatly improves the success of the operation. And specialized training in skull base is also very important, not for neurosurgery and for ENT as well. I would say that those are the two main aspects that I consider essential.

Dr. Pinheiro-Neto:

Yeah, and one more thing is when we're starting a team, a skull base team, this partnership with ENT, neurosurgery, it's very important at the beginning, to try to bring your neurosurgeon or the neurosurgeon bring to the ENT choice during cases as possible. So even cases that you technically don't need a neurosurgeon, I think it's worth it to bring them and work with them. So for example, when we started even a Draf III frontal sinusotomy, drilling out the frontal beak, not an intracranial surgery, but it's important to create the relation with your partner. Another thing, using the anatomy lab to dissect together, to learn the anatomy together, to create this... Really important to create this-

Dr. Peris-Celda:

Modifications of techniques.

Dr. Pinheiro-Neto:

Techniques and the learning how to work together, then gradually, is like a dance. The movements is going to be very harmonic.

Dr. Garret Choby:

Yeah. Those are really good points, I think, really insightful to hear. As we wrap up, and before I do a summary, any other things you guys wanted to share today?

Dr. Pinheiro-Neto:

No, I think, very nice, good, everything.

Dr. Garret Choby:

Excellent. Again, I really appreciate your time. I think you guys are great leaders in this field. You have done a great work so thank you for all of your effort and time today, and I think we'll all benefit learning your experience.

Dr. Pinheiro-Neto:

Thank you very much, dr. Chobby.

Dr. Garret Choby:

You're welcome.

Dr. Pinheiro-Neto:

Thank you very much. It was great.

Dr. Garret Choby:

Absolutely, thank you. So, as we move into the summary of today's talk, olfactory groove meningiomas are tumors that arise in the dura, just above the olfactory cleft, and it tend to extend intra-cranially. There are some fairly characteristics imaging findings, especially the dural tail on MRI scans. A number of potential approaches are possible, including both craniotomy approach, and an endoscopic approach. And each approach should be tailored to that individual patient, as well as their tumor characteristics. We've a few questions that we'll wrap up with today as we do at the end of every episodes.

The first question for today is what are typical presenting symptoms for patients with olfactory groove meningioma? Although these tumors can occasionally be found incidentally, some patients present with frontal lobe symptoms, such as, a lack of desire to do typical activities of daily living, and some patients also present with anosmia, or occasionally, if tumors extended far enough posteriorly, potentially vision changes. Next question pertains to the endoscopic approach. And as we think about this approach, what are some important reconstructions we consider in endoscopic approach?

A number of things should be considered, including the availability of vascularized rotation of tissue of the nasal cavity, as well as, consideration for inlays, whether that's synthetic collagen matrix or fascia lata. And then lastly, fall back options that also consider things like, pericranial flap or lateral wall rotation flap as well. Well thanks so much for joining us today, and that's all the time that we have. We had an excellent discussion with our guests, and we look forward to you joining us in the next episode of ENT In A Nutshell. Thank you.

