

Dr. Jason Barnes:

Hey there. Welcome to another episode of ENT in a Nutshell. My name's Jason Barnes, and today, we're joined by rhinologist and skull-based surgeon, Dr. Janalee Stokken, and we will be discussing sinonasal papillomas and inverted papilloma. Dr. Stokken, thanks so much for being here.

Dr. Janalee Stokken:

Thanks for having me.

Dr. Jason Barnes:

I'll start by just saying, we'll talk about sinonasal papillomas today. The majority of these are inverted papilloma, which tends to be the topic that's most talked about. So we'll weave in and out, talking about the different types of sinonasal papillomas, but mainly focus on inverted papilloma today.

With that Dr. Stokken, how do patients with inverted papilloma or sinonasal papillomas present to your clinic?

Dr. Janalee Stokken:

Yeah, that's a great question. So largely these are benign lesions that are either found incidentally. So a patient has a scan for some other reasons, say a headache or facial trauma, or even a sinus symptom and it's identified. When the patient actually presents due to the tumor, we often think about things like unilateral nasal obstruction, nasal drainage, or recurrent sinus infections. Occasionally people will have pain in the area of the lesion. That's likely from obstructing the sinus and having it fill up with mucus rather than the lesion itself. In other cases, there might be epistaxis or even something like epiphora, if the nasolacrimal duct is involved.

Dr. Jason Barnes:

And are there any risk factors or epidemiologic characteristics that make you more aware of these tumors or make you wonder if they're there?

Dr. Janalee Stokken:

You know, it seems that the common patient I would see in my clinic, who I would be worried about this, is an older gentlemen. So someone in their 50s to 70s, often Caucasian. The epidemiology that we kind of learn is that there is three to five men to every woman who presents with this type of lesion. And the incidents overall is somewhere between one and two in 100,000.

Dr. Jason Barnes:

Is there anything that has been teased out to demonstrate being a risk for the development of this tumor?

Dr. Janalee Stokken:

So there are no particular occupational or exposure type risks that we can associate with inverted papilloma. We do see some inflammatory cells often in the pathology. So there are some people who may think that sinonasal inflammation or sinonasal disease can be related to the papilloma.

Dr. Jason Barnes:

And when you evaluate this patient, you do your history and then we move on to physical exam. What are you looking for? Both on general exam, but also on rigid endoscopy.

Dr. Janalee Stokken:

In their general head and neck exam, we typically don't see any abnormalities of the external nose or of the face or skin or even the ear. I suppose, if this was a large tumor, you could have proptosis or some sort of sign that there's erosion into the orbit, but that would be pretty uncommon.

On rigid endoscopy, we would want to look for a unilateral nasal mass. Often it has a look of polyps, but it's usually more papillomatous and it has a characteristic smooth, but bumpy look to it that's different than the watery juicy type polyps that you would expect with CRS. Sometimes these can be friable and might bleed if you touch them with a suction.

Dr. Jason Barnes:

And next I wanted to move on to pathophysiology. Could you talk a little bit about what we know about the etiology of this tumor and maybe what could cause it?

Dr. Janalee Stokken:

Yeah. So we aren't sure. There are many articles in the literature that investigate this. Like I mentioned previously, some think there might be some inflammatory process related to the etiology. What's looked at in more detail is the possible viral etiology. And this is largely fallen on HPV.

Unfortunately, the studies show HPV involvement anywhere from 0% of the time to 100% of the time. So there's no consistent data that will link HPV to inverted papillomas. This might be from the way we test for HPV or the way we look for HPV, but we really don't know.

There is also some evidence that HPV might be related to the inverted papillomas that then become malignancies. But again, that data is not very strong. So in general, we don't know.

Dr. Jason Barnes:

Digging more into kind of the pathophysiology. Can you tell us more about this being unilateral versus bilateral and how it affects the local structures in the nose?

Dr. Janalee Stokken:

Yeah, sure. So they are generally unilateral lesions. When we look at the reports in the literature, we find that about 42% of them are found in the maxillary sinus, another 20% or so in the ethmoid sinus, 15% or so in the nasal cavity, and then somewhere around 10% attached to the middle turbinate or superior turbinate, and another 10% in the frontal sinus. They're rarely found in the sphenoid sinus, but they can be found there as well.

They can be locally destructive. So you'll see areas of bony erosion. You'll often see on imaging that there's an attachment site and that's just an area focal osteitis wherever that lesion started. That's kind of a nice hint or clue to the underlying diagnosis when you're reviewing the scan.

Dr. Jason Barnes:

And can you tell us a little bit more, what is the pathology that we see in this tumor?

Dr. Janalee Stokken:

I think, in general, they would describe it as an endophytic pattern. So of the different papilloma that we have in the sinonasal cavity, we usually categorize them into three groups. The first being inverted papilloma, where about 60% of these fall. And that's the group that has squamous epithelium that inverts into the stroma and an endophytic pattern.

The next group is the exophytic group and that's like you would picture kind of a warty looking lesion. That comprises about 30% of these cases. And then the last is called oncocytic, and it's only about 5% of papilloma in the nose. And it doesn't look too different than inverted papilloma on exam, but largely on pathology, we would just expect the cells to look more like oncocytes.

Dr. Jason Barnes:

And what's the malignant potential of these tumors?

Dr. Janalee Stokken:

So the exophytic type, which we normally see on the anterior septum, we don't expect any malignant changes. They tend to be more likely related to HPV, which is interesting, but in general, we don't expect them to become malignancies. The other two both have about a 10% rate of malignant transformation. If you look through the literature, those rates can be anywhere from 5% to 15%, 20%. And the type of tumors that they can change into are mainly squamous cell carcinoma, but others have been described as adenocarcinoma or small cell carcinomas. There's actually a long list, but very uncommon.

Dr. Jason Barnes:

And when you're seeing these patients in clinic and you suspect inverted papilloma, how do you counsel them on what the natural history of this disease is in terms of how this can affect them if it's not treated?

Dr. Janalee Stokken:

Yeah, that's a great question. So normally when we see patients, we don't know their diagnosis. So if I see a patient in clinic with a unilateral maxillary pacification, and I don't have any reason to think that it's a sinus infection or related to their tooth or a fungal ball, we have the conversation that this could be a malignancy or a benign tumor, such as inverted papilloma.

I usually counsel them that it's more likely inverted papilloma. As we know, sinonasal malignancy is much less common, but either way, the reason to go to the OR is to get the diagnosis and remove the tumor so that they have an answer to that and we can move on.

If it is a benign inverted papilloma, I then tell them there's about a 10% risk of recurrence, and we can talk about recurrence rates and surgical steps to lowering recurrence rates, going forward here. But with that 10% recurrence rate, we do need to be sure that they understand this needs long-term followup. It's not something that you have a surgery for and then you never come back to see an ENT ever again.

Dr. Jason Barnes:

And what else is on your differential diagnosis for an inverted papilloma or maybe more broadly unilateral pacification or unilateral growth?

Dr. Janalee Stokken:

Yeah. So this is a good question. Anytime there's a unilateral pacification or unilateral nasal finding, we worry about malignancy and there's a long list of malignancies, which is kind of out of the spectrum of this talk today, but that would be the first thing we'd want to worry about.

The next thing would be benign tumors other than inverted papilloma. So polyps or antrochoanal polyps might be on that list. If it's involving the maxillary sinus, we often think about odontogenic infections. So we would look at the teeth to see if there's any involvement from maybe a dental implant or a periodical cyst.

Other things that might fall on the list of unilateral disease is allergic fungal sinusitis, or even chronic rhinosinusitis with nasal polyps. It's not often unilateral, but it can be unilateral. Fungal ball or other fungal sinusitis would be on that list.

Dr. Jason Barnes:

And moving on to work up. When you see these patients, maybe in clinic, you see a unilateral mass on nasal endoscopy, what's your workup? And maybe we can start with biopsy. I guess my question is, do you routinely biopsy these in clinic and what considerations do you have in terms of obtaining a biopsy in clinic?

Dr. Janalee Stokken:

So I wouldn't say I routinely biopsy these in clinic. The amount of tumor you see, I guess is what I'm getting at, might be what leads you towards getting a biopsy. So if you look in there and you're sure it looks abnormal and it's in the front of the nose or in the middle meatus, somewhere where you can access easily and put packing in. You could consider biopsying to get your answer before going to the OR.

What I would say is I would never trust that biopsy 100%. So if that's negative and you still have a high concern for a tumor or inverted papilloma, you would still want to plan to go to the OR to get a better biopsy and to open the sinus and make sure you're getting a representative piece of tissue.

These tumors can hide in polyps and I've definitely seen patients with bilateral polyp disease that have inverted papilloma within one side. So a negative biopsy from the clinic doesn't rule this lesion out.

It can help you with surgical planning though. So if it's in an easy place to get a biopsy in clinic and you feel comfortable getting hemostasis, if there's bleeding, it really can help you know what do we need to do first to plan for that surgical procedure. Is it going to be a one-hour procedure? A two hour procedure? Is it maybe a malignant lesion and I need to involve another team or get the oncologist involved early? So those things are what typically run through my mind in clinic.

Dr. Jason Barnes:

And what's the role of imaging here?

Dr. Janalee Stokken:

You should always have a CT scan when you're evaluating a mass in the nose and it's never wrong to have an MRI and a CT scan when evaluating a mass in the nose. My reasoning for getting a CT is to one, look for that attachment site. If you get a hint to where it's attached, it will definitely help you plan your surgery. So the attachment sites, anterior and the maxillary sinus, you might be thinking of more an external combined with endoscopic approach or an approach that is more aggressive upfront than if you think that the attachment is in the ethmoid or the posterior wall of the maxillary sinus.

We typically use image guidance navigation so the CT scan will also be helpful for your surgical procedure in that that sense. It will also give you an idea if there's erosion of bone, and if there's erosion of bone into a structure such as the orbit or the skull base, that's really when you want to know if there's involvement beyond the sinus mucosa or into an extra ocular muscle or into the dura. And that's where an MRI will help you. I can say if the tumor is not involving the skull base or the orbit, I don't routinely get that MRI.

Dr. Jason Barnes:

And you said that you look for the attachment point. What are some things that you're looking for on the CT scan that might tip you off to where the attachment point is?

Dr. Janalee Stokken:

The classic finding is an area of hyper acidosis. So the bone can be thicker or say the attachment site is over the infraorbital nerve, sometimes that infraorbital canal is thickened and pointy. There's a spicule of bone that is asymmetric from the other side. That's the main imaging finding I'm looking for.

Dr. Jason Barnes:

And when you do obtain an MRI, what would this show for inverted papilloma?

Dr. Janalee Stokken:

Obviously the main thing you'd be looking for is a contrast enhancing lesion. The differential often includes fungal disease. And so a fungal ball can also cause bone erosion and can even cause more diffused sclerosis or thickening of the maxillary sinus walls. And so in a patient where you're not sure if they can tolerate surgery, an MRI will definitely help delineate the difference between a tumor, which would enhance and fungal disease, which would not enhance. There is some research that shows on contrasted MRI that you can see more of a cerebral form pattern, and that may help you decide that this is inverted papilloma over some other malignancy or enhancing lesion, although that's not super specific.

Dr. Jason Barnes:

And moving on to treatment, I know we're going to talk mainly about surgery today. Can you speak to any medical management or any radiation therapy that applies for these tumors?

Dr. Janalee Stokken:

No, there's really not anything medical that you can do. This is largely a surgical disease. All of the research points towards getting the lesion out, including the attachment site, being the way to prevent recurrent disease. I suppose in rare situations where you may be concerned about malignancy and the patient really can't tolerate surgery, you could consider radiation, but that's definitely not something I think about routinely.

Dr. Jason Barnes:

And could you now tell us about surgical therapy? What is your approach preoperatively in terms of how you counsel patients on what to expect? And if you don't have a biopsy, how do you make those plans and how do you choose your surgical approach?

Dr. Janalee Stokken:

Yeah. So this will largely depend on where this lesion is located. Like I mentioned earlier, the majority of these are on the lateral wall, primarily in the maxillary sinus. If the lesion is in that location, we will talk about the same risks as you would for endoscopic sinus surgery involving the maxillary sinus. So a 1% risk of bleeding, less than 1% risk of injury to the eye. We then we'll talk in more detail about how if this is inverted papilloma and we need to have long term surveillance that the opening into that sinus needs to be large so that I can use the endoscope for up to 10 years to have a look in that sinus and look for recurrent disease.

To do that, we often talk about a medial maxillectomy and that's largely needed anytime there is an inverted papilloma in the maxillary sinus. So what that surgery entails is taking the whole medial maxillary sinus down to the floor with removing a portion of or nearly all of the inferior turbinate. Sometimes that even includes coming underneath the nasolacrimal duct to open up the medial wall anteriorly. And even the next step would be to take some of the nasolacrimal duct down and open up the superior anterior part of the maxillary sinus to get a good view of the lateral wall or the roof of the sinus.

That puts the patient at some risk of developing post-op epiphora. And I think largely the decision whether to do a DCR is up to the surgeon performing this procedure. I don't routinely do a DCR and I found that my rates of a epiphora postoperatively are quite low.

If the lesions are involving the skull base or the ethmoid region, you're going to talk more about the risk of CSF leak or meningitis. And then if you're operating back in the sphenoid sinus, you'd of course worry about injuring the carotid artery.

Dr. Jason Barnes:

And how do you decide your approach? You mentioned medial maxillectomy. Is there a role for Caldwell-Luc procedure here coming anteriorly through the sinus?

Dr. Janalee Stokken:

Sure. Again, it's very much up to the surgeon who's performing this procedure. When we look at some of the data on recurrence, based on how the surgery was done, there's a good systematic review that shows the recurrence rate with 13% for endoscopic, 16% for open and 12% for combined. So if you have a lesion, especially in the maxillary sinus, it's more anteriorly based, you might need more access and that can be accomplished various ways. One of which is a Caldwell-Luc approach.

Other groups have described the modified Danker's approach, or you can do kind of what I described with a purely endoscopic approach, taking down the whole nasolacrimal duct, and using angled instruments and drills to work around that corner. In some cases you can even do a transeptal approach to get an angle towards the anterior part of that maxillary sinus and those are all going to be based on comfort of the surgeon who's performing that procedure.

Dr. Jason Barnes:

You mentioned recurrence. Can you tell us what you can do in the operating room to try to decrease recurrence rates in these patients?

Dr. Janalee Stokken:

Yeah. So ultimately what you want to do is figure out where that attachment point is. Often, I found that the attachments of the tumor is focal. So you can take the tumor down until you find where it's pedicle. Then you'll have a small area that you're going to focus the rest of your efforts on.

There's a recent study that shows if you drill that, their recurrence rate at least, was about 5%. If they cauterize the mucosa at the end of that procedure, at the attachment point, they also had a recurrence rate of about 5%. If it's in a location where you can take that bone out, so say it's the medial wall of the maxillary sinus, you can get the whole attachment point out. Their recurrence rate was 0%. And if you just strip the mucosa alone, the recurrence rate is as high as 50%. So we definitely don't advocate mucosal stripping in this procedure.

Dr. Jason Barnes:

And in terms of outcomes and expectations, what else do you counsel patients on in terms of postoperative debridements and follow-up?

Dr. Janalee Stokken:

I would often see these patients back anywhere from seven to 10 days after their surgery and that would be for the post-op debride that you're referring to. This is fairly similar to what we would do for an endoscopic sinus surgery. You remove any of the crusting or early adhesions that might be forming, make sure you're keeping that cavity you created nice and open so you can have surveillance long-term. You would also, at that appointment, make sure there's no infection or anything else that you'd want to treat to make sure the patient's comfortable and can breathe well and doesn't have any facial pain or pressure, or at least minimal pain and pressure.

We, from there, decide whether they should follow up in a week or two or a few months. If the inflammation's minimal and they're doing a great job with irrigating, with the Neal matter and Eddy pot bottle, I might push that follow-up out to a couple of months. And then from there, we need to plan kind of surveillance visits.

At first, I'll do those every three to four months for a year or so, and then I'll push them out to every six months for a couple of years. And then after three or four years, when that recurrence rate is highest, I guess we would then consider seeing patients yearly.

Dr. Jason Barnes:

And when you say surveillance, can you tell us, is this in-office endoscopy surveillance? And what's the role for imaging and follow-up surveillance?

Dr. Janalee Stokken:

Yeah, it's largely in-office endoscopy. The only time I think about getting a CT scan to follow these patients is when their tumor was in an area that's difficult to see or if the cavity that we made closed off or their stenosis or say recurrent polyp disease that's obscuring my view. So in the 10% of patients who might have a lesion up in the frontal sinus, those are the patients I'll get a CT on, instead of performing in-office endoscopy.

Dr. Jason Barnes:

Well, I think we've covered sinonasal papillomas pretty well. Is there anything you'd like to add before I move into the summary?

Dr. Janalee Stokken:

I don't think so.

Dr. Jason Barnes:

Awesome. Well, I will move into the summary. Sinonasal papillomas consists of inverted papilloma, exophytic papilloma and oncocytic papilloma, and they're benign tumors of the sinonasal cavity, often presenting with unilateral nasal obstruction. In terms of pathophysiology, there's some relationship with inverted papilloma and HPV, though this isn't entirely understood. Workup includes a CT scan to understand the extent of bony involvement and possibly determine the site of origin and in-office biopsy can be considered, though it's not always required. Treatment is almost exclusively limited to surgical excision, and this can be endoscopic with a medial maxillectomy, but an open approach is sometimes warranted. Recurrence rates are up to 10% to 15% and patients require ongoing surveillance for this reason.

Dr. Stokken, anything else you'd like to add?

Dr. Janalee Stokken:

No, I think we covered it well.

Dr. Jason Barnes:

Awesome. Thank you so much. I'll now move into the question asking portion of our time together. As a reminder, I'll ask a question, wait a few seconds and then give the answer.

So the first question is what are the presenting symptoms of sinonasal papilloma and what is the malignant potential of inverted papilloma?

The presenting symptoms of these tumors are usually unilateral obstruction. There's possibly epistaxis, rhinorrhea, epiphora or facial pain and inverted papilloma has a malignant potential of about 10%.

Next question. What is the primary imaging modality for inverted papilloma? And what are you looking for on the scan?

More often than not, we'll obtain a CT scan for these patients, although an MRI can be considered. On CT scan, the tumor will demonstrate a pacification. And in terms of attachment sites, we're looking for that area of hyperostosis or maybe where it looks like there's a little spicule of bone where the tumor might be attaching.

And for our last question, what is the recurrence rate of inverted papilloma and how should you perform surveillance?

As Dr. Stokken said, recurrence rates can be up to 15% and it can be dependent on how that attachment area is handled in the operating room. In terms of surveillance, this is almost always performed in clinic through nasal endoscopy, but if surgical exposure is limited or if the attachment site is not able to be seen in-office endoscopy, you can obtain a CT scan.

Thanks so much and we'll see you next time.