

LINDSAY Here we go. These are my disclosures. I don't really have any.

WACHOWIAK:

The first slide that we're going to review, just the two different instrumental assessments that we perform to diagnose swallowing impairments. The first is the videofluoroscopic swallow study, also called the modified barium swallow. At Roswell it's ordered as a video cervical esophogram.

So this study is performed in the X-ray suite in conjunction with the radiologist or a radiology PA. We are evaluating the patients swallow with different consistencies mixed with barium. We're able to evaluate the oropharyngeal and upper cervical esophageal phases of the swallow. We assess for function and dysfunction, and whether that has an impact and results in pharyngeal residue or stasis, and supraglottic penetration or subglottic aspiration.

The second exam that we perform is the fiber optic endoscopic evaluation of swallow, also called the FEES exam. This exam is performed by passing a flexible scope through the nose, and once the scope is in place, we're able to evaluate the structures at rest, and then upon movement. So we have the patient phonate, and evaluate vocal cord mobility-- as that's very important for airway protection during the swallow. And then we have the patients swallow different consistencies mixed with blue food coloring while the scope is in place.

So the benefits of this exam are that we can do it at bedside or in the clinic. It's a little less comfortable, because the scope is in place, but we don't have to drag the patient down to the X-ray suite, and there is no radiation exposure.

The most important takeaway from this slide is that swallowing evaluations are not pass or fail. We're evaluating for function and dysfunction, and the degree of it. And we're able to assess for the effectiveness of compensatory strategies, and whether or not the patient is able to start a diet-- and if so-- if it's a modified diet or not. As well, we also utilize the information obtained during these evaluations to form our treatment plans.

So in these two images on the left you can see Lauren, one of our colleagues, in the X-ray suite performing a modified barium swallow. And then I'm performing a FEES exam on the right.

So there are various swallowing impairment scales. We use three of them. The first is the modified barium swallow impairment profile, or the MBSIMP, we are certified in this at Roswell. It's a standardized protocol for interpretation and reporting of the modified barium swallow.

And then the penetration aspiration scale is an eight point scale. As the number increases, that means that there is a more significant penetration or aspiration. And the digest, which is a five point scale that shows the interaction of residue and laryngeal penetration or aspiration.

So the MBSIMP, these are the areas of impairment for the oral phase. Lip closure, tongue control, bolus manipulation, whether or not there's oral residue. The pharyngeal impairments include initiation of the swallow, or how promptly the patient triggers the swallow soft palate elevation. Oftentimes in our oral cancer patients, we'll see defects at the soft palate, or velopharyngeal insufficiency, which results in nasopharyngeal regurgitation.

Hyolaryngeal excursion, epiglottic inversion, the laryngeal vestibular closure. Pharyngeal contraction, and how well the bolus passes through the pharynx. Relaxation of the PE segment. Tongue base retraction, and pharyngeal residue.

So the upper cervical esophageal phase of the swallow is evaluated as well, and we are able to identify if there is narrowing or stricture at that level. So this is just, I threw in the penetration aspiration scale, it's an 8 point scale. And then the five point digest scale.

So we, over the years, have adopted a multi modality approach to treating dysplasia. We use evidence based swallowing exercises, and we determine which exercises to utilize based on our instrumental assessments. The Shaker exercise, which targets laryngeal excursion and relaxation of the upper esophageal sphincter. The chin tuck against resistance, which is a modified version-- a Shaker-like exercise. The Mendelsohn is voluntary prolongation of laryngeal elevation and respiratory muscle strength training, which is shown to improve cough, voice, and swallow function.

So we also evaluate for the effectiveness of the compensatory techniques during the instrumental assessments. And then we educate the patient on how to use these techniques when they're eating and drinking. So in our head and neck population, the super-supraglottic swallow maneuver is very effective. I'm going to show an image of that in a moment. We use effortful swallows in the Mendelsohn, which is prolongation of the laryngeal elevation.

So these images are kind of impressive, here. On the left, you can see this is a non-radiated larynx. And then you can see post chemoradiation here. All the fullness and edema of the supraglottic larynx, and how it almost diminishes the patency of the supraglottis and glottis.

In the third image, the patient is preparing to perform the super-supraglottic, so they're really clamping down at the glottic level, tucking the arytenoids towards the petiol of the epiglottis. And then they go on to swallow with a very effortful swallow, holding their breath. Oftentimes we instruct them to hold their breath for multiple swallows. This aids in airway protection and efficiency of passing the bolus through the pharynx.

So continuing on with the multi modality approach, we perform trismus therapy for reduced jaw opening. We are myofascial release trained, so that's a manual therapy. It promotes keeping the tissue flexible.

We do make quite a few referrals for lymphedema therapy. And we've been working with the two lymphedema therapists from Roswell quite closely, and have noticed a significant improvement in swallow function as the lymphedema resolves.

So the next image is of a patient that we co treated. And you can see, he was treated for nasopharyngeal cancer with concurrent chemoradiation. You can see on the image on the left-- oops, I went the wrong way. The image on the left, he has a lot of lymphedema on the cheek. But also, this submental area in the neck. And then this is post lymphedema therapy, you can see a significant reduction in the lymphedema here. And he also noted as a significant improvement-- and we did, too-- on his modified barium swallow.

We're huge proponents of exercise plus eat at Roswell-- the use it or lose it philosophy. So we really encourage patients to start eating and drinking after surgery-- if it's an oral surgery-- as soon as they safely can, and continue throughout treatment. We also make a lot of referrals to head and neck surgery, or GI for dilation-- for strictures or narrowing of the upper cervical esophagus.

So as far as the speech diagnostics and treatment, surgery and reconstruction-- plus or minus chemoradiation for oral cancer-- may affect articulatory precision, resonance secondary to velopharyngeal insufficiency, and voice. So we use a combination of informal assessments, as well as video laryngoscopy, to diagnose and treat these impairments. In addition, we work with the dental team regarding speech aids and obturator fabrication for palatal defects.

These are just my references. Now Amy's going to take over and provide us with some case studies.

AMY

SUMBRUM:

Thank you, Lindsey. I have no financial disclosures. Speech and swallowing following oral cancer surgery.

So speech and swallowing will be affected by the degree of resection, the type of reconstruction and whether or not there was a use of post-operative radiation therapy. We know from the literature and our practice, that as speech and swallowing outcomes often are the resections that preserve the neural innervation combined with reconstructions that allow optimal residual tongue movement, in particular the base of the tongue. If the base of the tongue is left intact, they will definitely have better speech and swallow outcomes.

The quality of the reconstruction rather than the extent of the reconstruction, and the shape of the oral tongue. So, for example, in a total glossectomy or subtotal glossectomy, the shape of the oral tongue will be very important. We want more of a convex protruberant shape to get that good lingual palatal contact it helps with oral transit time, and also help with speech articulation.

So complications after radiation therapy. Many of the patients that we see consistently and intensely are the patients that go on for radiation therapy. So much that this will be focused on that.

We know radiation will have a greater impact on swallowing than it does on speech. The deficits are often dependent on the dose and duration of radiation therapy, the extent of the treatment field. The use of chemotherapy can play a role. The acute effects-- edema, lymphedema, mucositis and odynophagia. Late or long term effects-- neuromuscular fibrosis, or neuropathic contributions, such as denervation of the suprahyoid musculature.

So here we have still images of a patient who was status post hemiglossectomy with radio and preflap reconstruction. And the first image is prior to radiation therapy. You can't really appreciate the oral phase of swallow, but he did fairly well in controlling the bolus. Base of tongue was left intact. He was able to propel the bolus down without difficulty, no aspiration, everything was very fluent, hypopharynx was opening freely.

The second image is one month post radiation. You can see that lymphedema has set in, submandibular. And posterior pharyngeal wall, which significantly impacts transit time, and also the opening of the upper esophageal sphincter.

So abnormalities of the swallow after radiation therapy. There are many I won't go into detail about every single one, but one I want you to just kind of focus on-- because I will review it in the videos that follow-- is post radiation edema and fibrosis of pharyngeal constrictor musculature, which usually impairs pharyngeal motility, incoordination. This causes retention of food, residuals in the pharynx, and increases the potential for aspiration.

So dysphagia and aspiration after radiation therapy. These are just some statistics. Dysphagia and aspiration are an underreported and underappreciated consequence of radiation and chemoradiation therapy.

It's estimated that at least 50% of long term head and neck cancer survivors will have a dysphagia. Aspiration rates are up to 84%. And up to 80% are silent aspirators. And the highest rates of aspiration occur more than 12 months after radiation therapy.

So this is a case study. 55-year-old man, stage four, fairly large tumor. HP negative squamous cell carcinoma of the right tonsil extending to the right nasopharynx, soft palate. Tongue base with multiple cervical lymph node involvement with extranodal novel extension.

He went on for a big surgery, bilateral neck dissection. Right composite resection, segmental mandibulectomy of the right mandible. Right oropharynx, posterior pharyngeal wall. Right nasopharynx to the skull base, right base of tongue and tracheostomy, and [INAUDIBLE].

He went on for adjuvant concurrent chemoradiation therapy. He completed his treatment in February of 2018. He was then referred to the SLP department one month later. He underwent his initial videofluoroscopic swallowing evaluation. And he was diagnosed with a severe oropharyngeal dysphagia.

So you can see from Lindsey's presentation, the aspiration of efficient scale was utilized. The higher the number, the more severe the swallowing problem. He scored an 8, which means he silently aspirated.

Using the digest scale, he had an overall score of severe. Aspiration was chronic but not gross. His efficiency grade-- that's the pattern of residue-- he had a 90% near complete residual.

His post treatment video swallow-- the date is wrong, it's 2018. So this is six months later. He had a moderate oropharyngeal dysphagia-- and this is after intense therapy-- his score went down to a 4. His digest score was a moderate, so he only had flash laryngeal penetration. And his efficiency grade-- the amount of residual that remained in the pharynx-- was only 50% to 90%, and he was able to try solids.

So as of January, his PEG tube was removed, and he was following a primarily full liquid diet.

Overall management, so exercise plus eat, we wanted him started on clear liquids right away. Referral to GI, referral to dental. He had a very large soft palate defect, so he needed a speech obturator. Referral to occupational therapy for lymphedema. Referral to PT to address neck pain and reduced range of motion.

Compensation, he was very efficient at performing the super-supraglottic swallowing strategy. Rehabilitation exercises were comprised of labial competence, buccal strengthening, lingual strengthening, base of tongue retraction exercises. Hyolaryngeal excursion and relaxation of the upper esophageal sphincter, including some of the ones Lindsey had talked about earlier. And myofascial release to hopefully slow the progression of fibrosis and increase flexibility of that posture.

So this is his pre-swallowing therapy video. You can see, he does not have much base of tongue movement. A little bit, his hyolaryngeal excursion is significantly compromised, cricopharyngeal opening is also reduced. He also had a narrowing below the upper esophageal sphincter. The amount of residual remaining was significant. Overall, pharyngeal motility was significantly impaired.

This is six months post swallow therapy with intense training. You can see we improved his hyolaryngeal excursion. And you can also appreciate from the previous one, the amount of edema has gone down, the bolus is passing through easily, and he's able to clear without difficulty. Only a minimal amount of pharyngeal penetration, he's using his strategies effectively, and did very well and was able to have a functional swallow once again.

So in summary, these patients are complex and challenging. But through the use of multi modality approach and evidence based practice, we can improve these patients' quality of life so that they can eat and drink and socialize happily once again. Thank you.