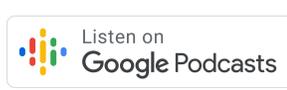


95| Neuropsych Bite: Clinical Case 9 – With Dr. Marc Norman

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Speakers: Marc Norman, Ryan Van Patten, John Bellone



Intro Music 00:00



Ryan Van Patten 00:17

Welcome, everyone to Navigating Neuropsychology: A voyage into the depths of the brain and behavior, brought to you by INS. I'm Ryan Van Patten...



John Bellone 00:26

...and I'm John Bellone. Today's episode is a Neuropsych Bite and a clinical case about a 48-year-old woman with a frontal brain tumor. Dr. Marc Norman presents the case. Marc is a board certified neuropsychologist and a Professor of Psychiatry

at UC San Diego. He is also the Executive Director of the International Neuropsychological Society, INS, who are our partners at NavNeuro, and Marc personally has played a huge role in the partnership. We are very grateful for his support for the podcast, and we are thrilled to have him on to talk about one of his clinical cases. So, with that, we give you our conversation with Dr. Marc Norman.



Transition Music 01:06



Ryan Van Patten 01:15

Okay, we're here with Marc Norman. Marc, thanks for making the time.



Marc Norman 01:19

Thank you so much for the kind invitation, gentlemen. I'm so happy to be here with a couple of rock stars.



Ryan Van Patten 01:25

[laughs]



John Bellone 01:25

[laughs] We've wanted to have you on for a while, so we are incredibly excited.



Ryan Van Patten 01:28

Yeah. So hit us with the first case.



Marc Norman 01:31

Okay. So the first case we're going to talk about today is a 48-year-old, right-handed woman with a Latina descent or Hispanic. She was referred to us for an evaluation following a brain tumor. She was originally diagnosed about 13 years prior to us seeing her. She had a surgery at a different university medical center and the pathology on it revealed an anaplastic oligodendroglioma, so a Grade III [three] lesion. She didn't receive any treatment - no chemotherapy, no radiation following the resection. She'd been followed as standard course for several years with MRIs, and then the MRIs stopped due to her being essentially stable. She didn't really have any symptoms or anything like that.

Then, as we look forward about 13 years, she started having headaches, started having uncontrolled vomiting and altered mental status. So she was brought into our medical center and there was found to be recurrence of her infiltrating tumor

that extended into her bifrontal lobes, so really kind of problematic. Additionally, there was some evidence of involvement of the anterior temporal lobes, and the right frontal horn of the ventricle was a bit compressed. So she underwent a second frontal craniotomy at that time, and then had been treated with temozolomide and with radiotherapy at that point.

What happened [was that] the way that this woman described things and the way that others described her were vastly different. In her reporting of her symptoms, she said that she had been doing very well. She had not had any personality changes - no increased aggression, disinhibition, those types of things. What she did say is she had maybe some mild increase in swearing and using profanities. But she otherwise denied changes in language, problems solving, spatial functioning. Really, the only cognitive things that she mentioned were some mild decrease in concentration, which she just thought was due to a lack of sleep.

So, as we do in many of these types of cases, we wanted to talk to those who know her. She had a friend who knew her and we got information from her daughter. What was really quite telling about this is that her daughter said that she had had episodes of confusion since her surgery. She became more forgetful and repetitive in conversations. She said that her mother's personality had changed quite a bit over the last few years, with her becoming more dramatic since her second surgery. There was more irritability, she was more prone to yelling and starting verbal altercations when she was frustrated. Her daughter described her as being mean and short tempered, which is quite different than how she was before. Now, what was quite interesting about this is - actually, I'll talk about her friend's report a bit later because that became really quite evident and I think ties together nicely with the evaluation and how things progress. But that was the big picture of how this woman presented.

In terms of her other medical history, she had seizures, which I think is important, following her first surgery. [She] has had about 10 to 15 seizures over her lifetime and the most recent had been several months prior to us seeing her. She was on an antiepileptic, she was on Keppra. As I mentioned before, she was on something for her brain tumor, the temozolomide, and then several other medications that are not generally known to have cognitive side effects.

John Bellone 05:25



Great. Marc, I want to summarize a couple of things. So you had said that this was an anaplastic oligodendroglioma, WHO Grade III. I think most of our listeners won't know exactly what that means. So this is a tumor that originated in the oligodendrocytes, the glial cells in the brain that are integral in myelin formation and

maintenance. The word “anaplastic” generally means that there's a lack of differentiation. It's a hallmark of aggressive malignant tumors. And then the WHO Grade III, that's out of four. [There are] four grades possible, with the fourth being the most aggressive. I just wanted to define that for our listeners.

So she was diagnosed and had the resection, and then about 13 years later, she had a recurrence with another resection followed by chemotherapy and radiation, right? I just want to make sure I got the details down.

Marc Norman 06:20



You got it absolutely perfectly, and it was a beautiful explanation. So she has this infiltrative tumor, which means it's sometimes very difficult to decide where the tumor stops and healthy tissue starts. It makes resection of these quite difficult. And it is right below the highest grade of tumor, but these tumors are known sometimes for transforming, so this can actually become a higher grade tumor at some point.



John Bellone 06:47

When did you see her after the second resection?



Marc Norman 06:52

Good question. We saw her, I think it was within a year of that secondary resection.



Ryan Van Patten 07:00

Just two questions come to mind for now, Marc. The first one being about her cultural linguistic background - when she learned English, where she grew up, things like that.



Marc Norman 07:13

I don't recall exactly where she grew up, but she was from the US. English was her only language so that made that piece of the picture a little bit easier without other significant components. I do really appreciate you asking that question because that's something we certainly take into account. Actually, I was just talking to someone a bit earlier today that, as opposed to just asking the questions, we want to make sure and interpret that data because it becomes really important in many of these cases, especially when we talk about focal lesions that may have a much more pronounced look in terms of understanding their language, linguistic, cultural picture and those contributions to cognitive performances.



Ryan Van Patten 07:59

Yeah, that's exactly what I was thinking. My one other question about the background is if she has any psych history? You talked about some symptoms noticed by the daughter in particular, and I'm wondering if any of those symptoms were long standing or what her personality and psych history was like before the tumors?



Marc Norman 08:16

Really interesting and great question. I'm going to make a very artificial distinction that I was just talking about an hour ago with one of our fellows actually, which is typically how we think about psychiatric issues in terms of being depression, anxiety, and those types of things versus those neurologic behavioral changes that we sometimes think of in the classic cases of people like Phineas Gage and in those that have either neurodegenerative diseases that may change that, like a behavioral variant, FTD, or lesion like a tumor. So I'm drawing a very artificial distinction. But she denied a history of depression, anxiety, those types of things, and only mentioned the mild increase in using profanities, although that was a very different feel from what her friend and her daughter said.



Ryan Van Patten 09:09

Got it. How far did she go in school, and what did she do for work?



Marc Norman 09:14

Sure. She graduated from high school and then did one year at a junior college, a community college here. She did okay in school. She worked, even after her surgery, she briefly worked as an accountant or a CPA. But ultimately, she had to quit due to an increase in seizure activity and she was making calculation errors at that point. The last time she had worked had been quite some time before we actually saw her.



John Bellone 09:42

I can't remember if you said this or I read it in the report, but you had mentioned that she had about 10 to 15 total seizures since the first tumor was found.



Marc Norman 09:52

Yeah, but none for I think it was a few months or several months prior to seeing her.



John Bellone 09:58

Okay.



Ryan Van Patten 09:59

Great. Any other questions right now, John?



John Bellone 10:01

What was her residence? What was her living situation and her ADL status?



Marc Norman 10:07

So her ADL, she was really doing things on her own. She was independent; she presented [as] quite functional from that perspective. She didn't really need assistance with anything. She had been living at a skilled nursing facility for a short time. She presents quite well, but you can tell there's something not quite right about her. And sometimes that's what's difficult. So in some cases like this, when there's no one living with someone, getting the real view of what goes on day to day becomes much more complex to figure out. People say, "Oh, I'm doing fine. I pay all my bills, I do all these things." And, in reality, things have fallen apart but it's not sometimes until much, much later that that picture comes to light.



John Bellone 10:52

Yeah. Any substance use history? And also, just general, how is she sleeping overall?



Marc Norman 11:00

She said that she doesn't have great sleep at times, which is what she was attributing some of the concentration issues to. But there's no history of really significant alcohol or drug use or anything like that. No DUIs, no tobacco use or anything like that.



Ryan Van Patten 11:20

Legal history? Litigation? Anything like that?



Marc Norman 11:23

No. No issues with any of those kinds of things. She hasn't been arrested or anything like that to our knowledge.



Ryan Van Patten 11:30

Okay. John, are we good to go?



John Bellone 11:32

Yeah. Why don't we talk through the behavioral observations, and then [an] overview of the testing process?

Marc Norman 11:38



Sure. She was actually quite pleasant and friendly throughout the evaluation. She was sometimes somewhat distractible, and sometimes it was an internal distraction. She was fidgeting with papers in her purse, looking at text messages, chewing ice cubes, those kinds of things. But there's nothing behaviorally inappropriate, no bizarre behaviors. Her speech was normal in rate, tone, and volume. We actually needed to test her over two days because she became increasingly fatigued over the first day. She was kind of dozing off, having a hard time keeping her eyes open. When she showed back up the second day, she was just doing much better. She was much more alert, but toward the very end, she started getting fatigued again. But we thought we got her most valid performance by that point.



John Bellone 12:29

Great. And then just a really high level summary of the test data, maybe by domain or however you want to break it down.



Marc Norman 12:38

So when you say high level, hopefully you don't mean my interpretation.



Ryan Van Patten 12:43

[laughs]



John Bellone 12:43

[laughs] I'm sure it's high level.

Marc Norman 12:46



Well, let's see what we can do. So, just talking very, very broadly here, she's a woman essentially of average intelligence, there's nothing quite striking. Again, her communication was quite good with us. She was a little slow on some motor things, like with fine-motor [tasks], but generally her strength and other things were quite good. In terms of her attention, none of her scores were particularly low. So, again, in a testing paradigm and on our tests, she actually did fine on all of those things. Her processing speed was in that low-ish range. Some of her scores were perfectly fine, not below a cutoff, and other scores were on the border of that. Again, nothing striking [or] that she was strikingly super slow on anything. Again, part of that may

have been somewhat of a motor component. Her visual spatial things were okay and, as I mentioned before, her language was okay. Slightly lower on her fluency scores with her lexical fluency, letter fluency being a bit better than her category fluency. Her category fluency was probably one of her most strikingly low scores, as with her Trails B [which] was actually even lower. So that was something that we picked up on. But what was interesting about that is some other executive scores with Similarities, Matrix Reasoning, and the Wisconsin, those scores were actually pretty good. There wasn't [anything] quite striking.

When one looks at her imaging, and we always actually review imaging first, she has a very large lesion that was there. But as we will, I'm sure, talk about, sometimes those things are misleading and we don't really capture things. So, day of, her executive functioning scores were quite good, but some of the things lagged behind. Her learning was actually quite low. At that time, we were using a different system and [it] would be classified as "moderately impaired". She seemed to forget some information over time. Her memory was probably the biggest domain area that was low. And then, I'll just quickly mention, as I said before, she's not somebody who considered herself to have significant anxiety or depression, so those inventories were low.

Ryan Van Patten 15:12



In terms of her memory profile, how would you describe that overall? You mentioned learning being low. What about retrieval? Recognition? Visual versus verbal?

Marc Norman 15:21



So, actually, because she had some of that fatigue going on the first day, we gave her the CVLT-II original form the first day. We decided to give her the alternate form [on] the second day. And what we saw was a very, very similar pattern, which is that her initial learning was quite low. T-scores of 27 and 29. So more than two standard deviations below what her age-appropriate norms would be. What we saw with her delayed memory is really a floor effect. She actually was about three standard deviations and over three standard deviations [below expectations] on day one with her short delay, free recall, and long delay free recall. Her recognition memory bumped up a little bit, but that's really sometimes difficult to pull apart because it is such a restricted range and it's not normally distributed. So sometimes it's just hard. Scores that look decent aren't really very decent simply because of the psychometrics of the measure. Her visual memory was quite similar. We gave her the BVMT and her scores were low, both on her learning as well as her delayed memory.



Ryan Van Patten 16:40

Got it. We definitely want to ask more about executive functions given the bifrontal nature of the tumor, but I wanted to ask one more about one more area first, which is motor tasks. You said the tumor is bifrontal, so we might expect that right and left hand grip strength, finger tapping those types of things would be about the same. I liked that you gave those lateralizing tests. Did you see any difference in terms of her speed or strength on one side versus the other?



Marc Norman 17:10

Let me describe this lesion for you a bit. We have her pre-surgical scans as well as her scans closer to where we saw her. So when this started - again noting that she had already had a resection by the time we saw her - she wasn't reporting any significant motor [issues]. There's no hemiplegia, she certainly didn't grossly present with any motor issue. So it really was quite frontal. Her original lesion really extended out and compressed into her corpus callosum, it was coming across [and] there was quite a bit of mass effect, midline shift prior to the first resection. When we saw her prior to her second resection, there was less midline shift. There's clearly some new tumor that was growing, recurrence of her tumor, but there really didn't look like there was a lot of involvement with her left hemisphere. So when we looked at the testing in terms of her motor findings, there really wasn't anything, as I recall, that looked really quite lateralizing. That's not terribly unusual because we have very big motor pathways. By the time we see her the second time, there may be some reorganization. We are more anterior to her motor [area], so it's not particularly striking that we did not come across things that would affect her motor pathways, which is, again, why we really need to look at her imaging to get a better sense of that. So if we're doing brain mapping in the OR or other kinds of things we can figure out what we need to be most sensitive to. What do we need to measure in the course of her surgery to protect language, protect motor, protect SMA, and other things as appropriate?



John Bellone 19:00

That's a great point. So, Marc, I'm going to tee you up here. How could it be that if she has this massive bifrontal lesion that she did okay on the Wisconsin and the Stroop Color-Word Interference, Matrix Reasoning? How's that possible?



Marc Norman 19:14

I'm going to say it to you this way, John, if I may, how in the world should I know?



John Bellone 19:21

[laughs]

Marc Norman 19:21



This is the beauty of the brain, in large part. I think we need to be humble in how much we know and understand, and then the exponential magnitude that we actually don't understand at this point. When you're working with epilepsy patients, you simply don't see lateralized features sometimes. And sometimes when we're doing brain mapping, you know, we're touching - we had, I'll try not to digress too far. I apologize, gentlemen, you can cut this out. So there have been times where we were touching the left side of the brain and the left face started twitching. And we're just like, "That's not supposed to be how it works." So, you know, for five minutes we kept touching it because we're all like, "This is just amazing." And the patient is getting bored with us, just being overly stimulated with something that just doesn't make neurologic sense. But, I think, in large part, executive functioning is such a large area and it really has to do with drive and it has to do with following through with things. We don't measure those things well with paper and pencil tests. So what we really started doing - what you're teasing me up and you so graciously did for this, is one of the things that we found out after getting done with most of this. We talked to her friend and found out that she had recently been at her hairdresser's appointment and she got really upset with her hairdresser. So she just picked up what was near her, which was a pencil, and jabbed it into her hairdresser's leg. Yeah. [to John and Ryan's facial expressions] That's a good expression. Like, that's really super bad.



John Bellone 19:53
[laughs]

Marc Norman 19:57



We don't have ways of picking up on those kinds of things on testing. Again, she was perfectly appropriate with us, she was just externally fidgeting with things. But that kind of impulsive, disinhibited behavior we sometimes don't pick up on because we don't press those things. There may be other triggers in the real world. So sometimes families are really helpful in describing this. But if somebody is living on their own, or they're living in assisted living, these things may not be picked up on. I can tell you, our brain tumor team was just floored to find out that she had a propensity that was not uncommon for this kind of behavior, because none of us on the treatment side ever saw that with her before.



Ryan Van Patten 21:38

She could hold it together in the formal testing session for a short period of time, but put her out there in the world and she's unpredictable in certain situations.

Marc Norman 21:47



Yeah, exactly. So we sometimes, again, need to be humble about that. Just because we test some things doesn't mean that we test every thing. Sometimes these types of behaviors are the most concerning to families or they put other people at risk, because of inhibition, because of impulsivity. But it's not something that we always see in our very structured, very finite testing session. So I think this is a beautiful case to demonstrate that. It would have been very easy had we not - we talked to her daughter [and] we never would have known, it never got brought up. But we talked to a friend, and suddenly it's there. So it's a very humbling experience sometimes because there are things that we sometimes miss. But if we understand the frontal lobes and some of the models of the frontal lobes, and we break things down into the constructs of orbitofrontal and the construct of dorsolateral prefrontal and anterior cingulate, they are lovely models, but sadly, brain tumors like this don't obey those boundaries. And nor do things like strokes and the distribution of an anterior cerebral artery stroke. Our brains just don't work like that. So sometimes the classic things that we think about that we're going to see, we just don't see in real life. And this is a lovely example of that.



John Bellone 23:10

Yeah. I see it all the time in my rehab unit, just things that don't fit the model.



Marc Norman 23:16

Yeah.



John Bellone 23:16

I'm with you here.



Marc Norman 23:17

It's the rule as opposed to the exception.



Ryan Van Patten 23:20

Yep. You had alluded to this Marc, another symptom that can come out of frontal lobe injuries like this as anosognosia, or lack of awareness. You had mentioned the discrepancy between the patient's report where she mostly downplayed how things are for her right now. She's said maybe some difficulty with concentration or mildly irritable, mildly increased swearing, I think she said, but didn't think to mention the incident with the hairdresser or some of the really big behavioral changes. She doesn't have insight into it.



John Bellone 23:20

Yeah.

Marc Norman 23:51



That's a great, great point, Ryan. She simply doesn't see those things. What you see sometimes in individuals that have these kinds of injuries, or have these types of changes, they believe that their behavior is just like they were before. It is normal behavior. It's other people that have caused a problem. Often they don't even report these things because it wasn't something that registered as an abnormal situation. But, you know, in this case, I would also think about if she actually remembers this. We know that her memory is quite impaired. So I'm not sure - we didn't ask her because we found out about this information after the fact - if she even remembers the incident happening, which may be an issue too.



John Bellone 24:33

All of this highlights the importance of the collateral information.



Marc Norman 24:38

Absolutely.



Ryan Van Patten 24:40

I'm glad that no one was getting stabbed with a pencil during neuropsych testing, and that everyone made it through that process safe. [laughs]



John Bellone 24:48

[laughs]



Marc Norman 24:49

I usually try to get out of the room and just leave the interns in the room, just in case something happens.



Ryan Van Patten 24:55

[laughs]



Marc Norman 24:56

I'm sure you'll cut that out and not keep it in there. [laughs]



John Bellone 24:58

[laughs]



Ryan Van Patten 24:58

[laughs]



Marc Norman 24:58

Oh, no, no, no. It is truly always “safety first”. We never want anybody feeling unsafe, either being unsafe or even feeling unsafe. That is really important to us.



John Bellone 25:10

Marc, anything you want to say about the recommendations? Or how this eval might have informed the surgical decision? Or anything else before we wrap up?

Marc Norman 25:20

You know, sometimes it's helpful to know this information prior to somebody going in for their second surgery. There's been an evolution of our teams, and certainly a change over in surgeons. So this is someone we'd likely now would have seen prior to surgery to look at the behavioral issues or other issues that may be there before and after.



In this case, a big piece of what we can do is educating family members and friends because this is a woman who will really need some level of oversight. You know, this is somebody who is at risk of deciding, “Oh, I think I can drive.” Or, “I want to drive.” So we need to put things in place. And then because she doesn't have people that are close to her, we talked about having a case manager and even considering the possibility of needing a conservator for her. Because certainly as she gets older - she's quite young right now - or if she gets more tumor recurrence, she can have a downward trajectory. We need to have the supports in place. So talking to the family, talking to the team about those things are some of the things that we believed to be important, as well as other programs in the community. There is a program here for acquired brain injuries, so we talked to the family and the team about some of those things that do provide some help with executive functioning and other types of things like that.



Ryan Van Patten 26:42

Great. Well, thank you for that case presentation. Very illuminating. Before we move on, we'd like to ask you our two bonus questions that we ask all of our guests. So just to give you the intro, these apply to neuropsychology broadly. So

we'll be taking a turn in a new direction here. If you can improve one thing about the field of neuropsychology, what would that be?

Marc Norman 27:03

Oh, well, that's a really - I thought you were going to ask me how many lobes does the brain have or something like that and then I would just be shamed horrendously into that. [laughs]

I will push back a little bit on your question because I can be someone who can complain for a long time about a number of things in neuropsychology. I think I want to be fair and first say that there's a huge number of things that we do well, and I see such an evolution in neuropsychology. Maybe I'll say a couple of things here. One is - this is going to be my theme of the year. So if you see me do any talks or anything like that, my theme of the year is really moving toward a level of integration and precision neuropsychology, where we're taking into account imaging, we're taking into account biomarkers as we know them to be helpful at this point, which is still very limited, and that we're taking in these social determinants. I think the evolution of integrating those things with background history, with test performance, with normative data is a thing that we need to stay up with and I think get ahead of a lot of these things.



But I think one of the things I would love to see in neuropsychology more is the integration of addressing what's important to other people and not patting ourselves on the back of, "How great did I do that interpretation." So it's integrating these things. One of the things I love is the teams that we work with, they really appreciate what we do. I love seeing that throughout. When people worry about, "There's no room for us in medical...", that's the complete opposite experience of what we have because I think there is such a really important role. I think our ability, especially here in North America and the United States, to help develop that in other places. That's a large part of, obviously, you guys know that we do the INS - I love, love, love, love seeing that. How the growth of neuropsychology and the appreciation of what we do is being moved to other places in the world, but in the context of those other places, not us like colonizing other countries with US or North American neuropsychology. So there's, I think, a lot of room for us to grow both internally and externally, which I think is a really great place to be in neuropsychology.

John Bellone 29:30

Yeah. I love it. We've talked a lot about that on NavNeuro already, and we will continue to do so. I love that. The second bonus question is what is one bit of advice that you wish someone had told you when you were training or maybe



somebody did tell you that really made the difference? We're looking for an actionable step that trainees can take.

Marc Norman 29:48

So that's a little hard to answer because my two biggest mentors were Erin Bigler and Dean Delis. So to say that they didn't tell me something would be like saying that they failed at their job, which I would not say in public. But, I think the thing that I - you know, this is really an interesting question because I am thinking about this in several different ways. I think that many junior people should be encouraged to follow their own path. My path just kind of came about, but I know some people struggle with a lot of anxiety, "Where will my path get me." I really want to encourage people and what I talk about a lot with people is, "You will be fine."



Some people are incredibly focused, and from the moment before they enter graduate school, their path is determined. They are so focused, and I think that is so wonderful. But for other people, like me, that's not what happens at all. But yet we all get down our path, and we end up being there. I think that's an important thing for people to hear. A path will come to you. It will be okay. I think that's such an important thing to hear for people who are really concerned. There is a path and not everybody has to follow the same path. That's just not how it works. We're all quite different, and the opportunities in front of us are different, and our paths to get there are different, but it ends up being fun. I just encourage people to follow their path and really enjoy what they do.

Ryan Van Patten 31:24

Well said. Yeah. I really value the importance of breadth, which you can get with a windy path. Some particular person might not start out in grad school, year two or three, studying the niche population that they're going to spend their career on. But wherever they are at that time, in psychology and social sciences and neuropsych, that will likely be useful in some way later on. I think our training models do a good job of not allowing us to hyper-specialize too early and allowing us to take time to get that general training, which is related to what you're saying with a windy path. There are benefits to it.



Marc Norman 32:02

Yeah. Absolutely. Well stated.



Ryan Van Patten 32:04

Great.





John Bellone 32:05

Well, thanks, Marc.



Transition Music 32:06



Ryan Van Patten 32:10

Well, that does it for our conversation with Marc. We have another clinical case with Marc coming up as well as episodes on polypharmacy in older adults, working memory, and other topics. As always, thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.



Exit Music 32:28



John Bellone 32:52

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Ryan Van Patten 33:03

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