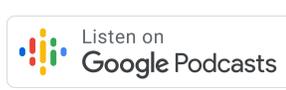


101| Neuropsych Bite: Clinical Case 11 – With Dr. Ronak Patel

August 15, 2022



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Speakers: Ronak Patel, John Bellone, Ryan Van Patten



Intro Music 00:00



John Bellone 00:17

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



Ryan Van Patten 00:26

...and I'm Ryan Van Patten. Today's episode is a Neuropsych Bite and a clinical case about a 43-year-old man with a left middle cerebral artery stroke. Dr. Ronak Patel presents the case. Dr. Patel is a board certified clinical neuropsychologist and

assistant professor at the University of Manitoba in Canada. So, with that, we give you today's clinical case.



Transition Music 00:50



John Bellone 00:59

All right, we're here with Ronak Patel. Ronak, thanks for coming on. It's good to have you on the podcast after all of our study months, maybe even a year plus, that we were partners. So thanks for coming on.



Ronak Patel 01:11

Absolutely. It's my pleasure to be here with you both.



John Bellone 01:14

Tell us about the first case that you wanted to cover.



Ronak Patel 01:19

Yeah, so, this first case is a 43-year-old White gentleman who is right-handed, and he was referred to me after he suffered a cerebrovascular accident. More specifically, he had an embolism in the left middle cerebral artery, or left MCA, which resulted in a large area of infarction in the left posterior temporal lobe as well as the left parietal lobe. I work in a rehabilitation based setting. In our setting, what we do is we typically see individuals with acquired brain injuries such as this, and when we see them initially, we typically do what we call a neuropsychological screening assessment or abbreviated assessment. Then we use that assessment and that data to determine who needs follow-up, or who would be best served by a more comprehensive assessment and who really may not need it at all. He's somebody that I saw for an initial screening assessment about a month after his CVA onset and then we had referred him for a follow-up assessment approximately one year later. So I had seen him again one year later after his initial screening assessment.



John Bellone 02:44

That's interesting. If we can pause there. Is that typical of Canadian rehab settings? Or is that unique to your facility or your preference? Tell us more about that.

Ronak Patel 02:58



I think it's pretty unique to our setting here. It's a service that I wanted to set up in part because we are really stretched in the province of Manitoba for psychologists and resources in general. Because of the nature of ABI, we know that recovery is ongoing and it's happening especially within the first 12 to 24 months. We didn't want to be in a situation where we were doing comprehensive assessments on everybody, especially because not everybody needed it. So to better triage patients, we decided we would start with an abbreviated battery that looks at some critical areas of cognitive functioning and use that data to delineate, "Okay, who do we need to see over the long term?" Because we see them relatively early in their symptom onset, I would say 4 to 6 weeks after their symptom onset - so in the subacute phase - and then who really may not need any further follow-up. Kind of better decision making around those types of questions. So part of it is a continuum of care and appreciating the type of conditions that we're working with. In stroke and TBI, we know that recovery is something that we need to be mindful of and so that's why we set up to service the way that we have.

Ryan Van Patten 04:25



Can you tell us what specifically you're looking for in a screening evaluation that would let you know whether or not a follow up comprehensive neuropsych eval is necessary? Is it simply that somebody does very well in the screening evaluation and then you say, "Comprehensive testing is not necessary"? Is there more nuance to the decision?

Ronak Patel 04:46



Yeah, that's a great question. The development of both batteries have been dictated by the major referral questions that we've been asked. Probably the most central question to all of our referrals that our attending physicians want input on is return to work. That is the most central question that they are wanting assistance on. "Can this individual return to work in light of any cognitive weaknesses or if they do present with any cognitive impairment?" With our screen, we've developed it such that we believe that it's comprehensive enough that allows us to make the determination of whether somebody can return back to work or, if they are showing some signs of impairment, that we would monitor them over the long term. I would hate to say it's as basic as, "If somebody is within normal limits, they don't need one. And if they're not, they do need one," because there are nuances there. Somebody could be showing weaknesses, but we're not necessarily too concerned by the extent or the severity of those weaknesses in terms of their functioning and return-to-work planning, where others might be more severe and we would want to see them over the long term and do that more comprehensive follow-up once they've had more chance to recover.



Ryan Van Patten 06:09

Makes sense. Maybe for our listeners, let me quickly review the basic information you gave, Ronak, and then you can continue to give us more info about the patient. So, a 43-year-old, White, right-handed, man. Embolic stroke, left MCA. And then an infarct, a lesion, in the left posterior temporal parietal region. And you saw him in this rehab setting. So what else would you like to tell us?

Ronak Patel 06:33

Yeah, so, our initial screening assessment revealed that the patient was actually doing really well on most cognitive domains. Working memory, episodic memory, most aspects of executive functioning were well within normal limits or well within expectation for his age and where we would expect him to be. Visual spatial processing was also preserved. But, not surprisingly, he was having some difficulties in aspects of expressive language. He did quite poorly in naming as well as verbal fluency, I believe.



What was perhaps most striking beyond his test scores and his relative profile of strength versus weakness was his conversational speech. I think, to this date, it's probably the patient that still sticks out to me the most in terms of his behavioral presentation in terms of his expressive speech. His expressive speech was generally fluent and coherent. His auditory reception abilities were quite intact. He understood what you were asking of him, he understood test instructions, but his expressive output was marked by a significant number of phonemic paraphasias as well as semantic paraphasias. So, for instance, he said, "dinny" instead of "dinner". Another phonemic paraphasia was "descript" instead of "describe". He would also make semantic paraphasias. So, for instance, he said "when I saw you a few years ago" rather than "when I saw you a few months ago". Those types of word substitutions and paraphasic errors were noted throughout his speech and were very prominent in his initial screening assessment. Because the speech was quite striking to me even though the impairments on testing weren't quite as striking, I wanted to see him for a follow-up to see how he would progress. Also, we hadn't done a super comprehensive assessment so I was trying to keep that in mind in terms of guiding his care. So we did a follow-up assessment one year later.



John Bellone 08:50

Ronak, sorry, before we get into the results of that, I wanted to also make sure we don't miss any other potential demographic or background factors that might be important. Any history of psychiatric issues or substance use? I know we neuropsychologists want to go right to the data [laughs], but can you give us more information about his background before we dive into the one year results?

Ronak Patel 09:15

Yes, absolutely. So this gentleman had a grade 12 education. He was working full-time prior to his stroke in a managerial position, and he was the manager of an automobile paint and body supplies company. Some of his job duties included managing seven other employees. He was in charge of holding weekly staff meetings, responding to email inquiries. He had to go out and meet customers and make sales-related phone calls and meet with clients for potential new business as part of managing this supply company. His medical history was significant for a long-standing diagnosis of psoriasis. He had deep vein thrombosis, which was about three years prior. He had a diagnosis of bilateral Bell's palsy, something that occurred about 21 years prior. He also had a history of migraines. He, I think just prior to his stroke, had also been recently worked up with a sleep study and was recently diagnosed with sleep apnea. So that was something that was being investigated at the time of the stroke, and he had not yet been on CPAP because he was waiting for that assessment to go through and get on CPAP as an intervention for his sleep apnea. This is somebody who played football quite regularly as a teenager in high school and he mentioned that he had a number of concussions. However, none of the concussions resulted in any loss of consciousness or hospitalization and, by all accounts, he reported that he generally recovered from those concussions. In terms of medications, he was taking a statin, ESA, as well as medication pantoprazole for some acid reflux. He was a long-standing smoker. He dated his cigarette use - he described it for about 20 to 25 years he had been smoking cigarettes, and then once the stroke happened, he remained abstinent from smoking. So he had not returned to smoking after his stroke onset.



John Bellone 11:39

Any psychiatric issues?

Ronak Patel 11:41

No history of any psychiatric problems or mental health issues prior to his stroke onset; however, there were a number of psychosocial factors and issues going on which were really illuminated by his wife. They had a son who was dealing with significant substance dependence and substance use issues and had recently been hospitalized for substance-induced psychosis. My understanding is that [his] son was in and out of treatment and in and out of homelessness as well. So that was an ongoing source of significant stress for the family.



Ryan Van Patten 12:21

I have a question before we move on. Could [you] talk us through the very basics of what we might expect from a left temporal parietal lesion in the perisylvian area?

How [would] that map on to these very traditional stroke syndromes we think of like expressive-receptive aphasia, conductive aphasia? And then you started to talk about what we've noticed in him, but stepping back, what would we expect after seeing his neuroimaging and his lesion?

Ronak Patel 12:52



Yeah, so it's a great question. With the left MCA, broadly speaking, you could compartmentalize or separate them out into the left MCA superior division, which is more of the frontal area of the brain in terms of MCA supply, versus the inferior division, which is more posterior part of the frontal lobe, parietal lobe, and temporal area. Because his findings were more posterior, I think there was probably greater overlap in terms of the left MCA inferior division supply. With that, you would generally, broadly speaking, expect because of temporal involvement Wernicke's over Broca's aphasia. You might also expect a visual field deficit, there could be physical hemisensory loss on the right side of the face and the arm, and there could be limb apraxia. You might also see in the inferior division parts of Gerstmann syndrome - so acalculia, agraphia, right-left disorientation, as well as finger agnosia. Now, that's kind of a classic syndrome case. I will tell you, in clinical practice, you rarely see these kinds of clear cut distinctions. I would argue that this gentleman here did not fit the superior division versus inferior division categorization cleanly. He didn't have Wernicke's aphasia. I think one could argue he might have had elements of Broca's, but it wasn't a clear cut picture. They usually aren't.

Ryan Van Patten 14:37



Very glad you said that. That was on the tip of my mind for sure. Very briefly, he didn't have trouble with comprehension, which is one of the hallmark characteristics of receptive or Wernicke's aphasia. His speech was generally fluent and coherent, [he] was not stuttering and halting the way we might see with Broca's or expressive aphasia. He did have naming issues, you had mentioned, which comes along with a lot of different left MCA stroke syndromes. I wanted to highlight that.

John Bellone 15:09



Also, I think it's important for listeners to know that the MCA covers a large portion of the brain. About half of the brain is fed by the MCA, and so it is a large distribution of blood.

Ronak Patel 15:20



We should mention beyond supplying a large cortical surface of the brain, it also feeds into deep subcortical structures including parts of the basal ganglia, the

thalamus, and internal capsule as well. So, you know, it covers a large part of the brain, both cortical and subcortical.



John Bellone 15:39

You can get quite a diverse range of symptomatology because of that.



Ronak Patel 15:44

Absolutely.



Ryan Van Patten 15:46

We've been halting you from talking about the comprehensive test data for a few minutes here. [laughs] Thanks for rounding out all this information. If there's any other background you want to give us, that's fine, otherwise I'm ready to hear about the comprehensive test data.



John Bellone 16:01

And the symptoms that the patient was noticing and whether he had insight into his difficulties as well.



Ronak Patel 16:07

Yeah, absolutely. So, after one year, it's always nice to see patients for follow-up and see how they've done over the past year. One of the first things that I noticed in meeting with him was a qualitatively substantial improvement in his overall expressive fluency. He was making much less paraphasic errors in casual conversation than the year prior. It was quite remarkable to see how much improvement he had achieved over the year, just qualitatively. I think that was thanks to a very aggressive outpatient rehab that he had undertaken. He was doing speech and language therapy about, I think, 4 or 5 times a week along with other things like occupational therapy because physically he actually had recovered quite well.

So about a year later, though, despite this qualitative improvement that I was noticing, he was pretty quick to point out his ongoing difficulties with his expressive language. He could acknowledge that there was improvement, but he was very fixated on the fact that it wasn't back to his premorbid baseline. When you asked him about how he would describe his problems in speech, he said he still struggles to find the word he's looking for. It takes him longer to find the word that he's looking for, he may use the wrong word than the one that he intends, and then it also takes him longer to think of the words that he wants to say. And, certainly, if you compare, it did line up with his - despite the improvement that I was [seeing]

qualitatively, behaviorally, you could tell that there were still elements of speech problems. There were extended pauses in his casual conversation. There were some phonemic paraphasias that were still evident at his follow-up. His responses tended to be short in conversation, and I think that is something that he had developed over time in terms of trying to keep his language and responses succinct when talking in casual conversation.

He also said that although he could understand what he reads, he really struggled in more busy environments. So if there was a lot going on around him or it was busy or he was distracted by other information, his comprehension was reduced. He really needed to be in a quiet environment. He had to really focus in order for him to understand the material he was reading. With respect to his writing or his spelling, he said he would notice grammatical errors. He could generally notice them and would go back and correct them, but he was certainly making them when he was writing.

He didn't endorse much in the way of memory problems. He said that he was a little bit more forgetful than prior to his CVA but it didn't seem to be particularly problematic for him or something that he was concerned about. Whereas his wife really noticed that he had difficulties with his short-term memory. She alluded to difficulties with short-term memory and [that] he also had problems with decreased thinking speed or [that it] was taking him longer to process information. She was also quick to notice that, with the memory, he was more reliant on external reminders - so he needed to either write things down or had to check with her or the calendar more than he would have previously. The last thing she noticed, and something that he mentioned as well, was a lot of reduced stamina and fatigue, which is very common post-stroke and was still an issue one year after his initial symptom onset.



John Bellone 20:15

Can you tell us what you found on testing? Just very broad strokes and then your general impressions as well.



Ronak Patel 20:23

Yeah, absolutely. So in terms of his overall results, he was oriented to time, place, and date - no concerns about orientation. We didn't do a lot of extensive performance validity testing with him, but on all indicators, either standalone or embedded measures, he was well within normal limits. We did a full WAIS on him, a WAIS-IV, and his overall IQ fell in the low average range but this was really affected and disproportionately affected by lower verbal comprehension skills. He scored generally lower on all verbal based tests than nonverbal based tests. His

Perceptual Reasoning Index fell well within the average range and so did all his other primary indices. His Working Memory Index, his Processing Speed Index were all within the average range of ability. We administered the Test of Premorbid Functioning, which also placed him within the average range and this was really consistent with his educational and occupational background. Beyond that, in terms of going into different domains, his working memory was generally solid but on a test of passive attention, digit span forward, he was slightly below expectation in the borderline range. But on [digit span] backwards and sequencing he was solidly within the average range. [On] tests of information processing speed, his performance ranged from the average to the superior range - so his processing speed fell solidly where we would expect it to be.

In terms of language, this is where we saw more variability where he did fine on some tests and poorly on others. His expressive vocabulary fell within the low average range or within normal limits, but he was impaired on other tests like verbal abstract reasoning where he really struggled to express the relationship between the different words that were presented to him. Also verbal fluency, his performance was impaired on phonemic fluency, whereas his performance was intact on semantic fluency. If you look at his performance, his qualitative responses on FAS, he tended to make very short words. So for the letter A, "at, about, and, are" - he tended to stick to very short words. On the Boston Naming Test, he was in the borderline range. No semantic cues were administered, but he was administered 10 phonemic cues. But out of the 10 phonemic cues, he was able to successfully get 8 of the item names. So certainly difficulty with underlying retrieval there because he was able to access the word in the presence of the cue. That's probably where we saw the most amount of variability.

Visual spatial processing was very preserved. His performance on blocks and the Rey was well within normal limits. Episodic memory was also generally preserved. We gave him the CVLT, the WMS stories, as well as the BVMT and the Rey Complex. Across all tests, his skills in acquisition, his skills in delayed recall, recognition generally ranged from the average to superior range for his age. The only blip in his memory was there was some susceptibility to interference because on the word list recognition test he endorsed an elevated amount of false alarms. But this wasn't a pattern that was picked up on the rest of the recognition testing. It seemed quite specific to the word list.

And then finally, most aspects of executive functioning were also relatively well preserved or intact. So inhibition, alternating attention or set shifting, abstract reasoning with the exception of verbal abstract reasoning, and conceptual problem-solving on the card sorting test were all generally within normal limits. There were some mild errors on the Wisconsin in such that he failed to maintain set

on a couple of occasions, which placed him in the borderline range, but he was nonetheless able to get all 6 of 6 categories and did quite well overall.

We also administered some mood-related questionnaires. We gave him the HADS and his indices, his profile for both anxiety and depression were within normal limits. We also administered the PAI and, generally, there were no validity concerns on the PAI and his profile was not clinically elevated for any psychological or psychopathology on any of the major indices. There was some preoccupation with his general health, which made sense in the context of his CVA, but nothing that was clinically elevated.

Ryan Van Patten 25:41



Great. Thank you for describing the test results. Really stepping back and looking at the whole of his profile, my first thought is it seems to fit fairly well with a left MCA stroke and what you initially described as his difficulties with word finding and paraphasic errors. Most of the difficulties he had on testing were on verbal tests, either Verbal Comprehension Index from the WAIS, like similarities, also naming, verbal fluency - that's not surprising. Other areas seem to mostly be intact. So it would seem logical then to attribute the areas of difficulty on testing to the stroke. Was it that simple or pretty straightforward in that regard? Anything else you want to say about your attribution or etiology for his cognitive difficulties?

Ronak Patel 26:34



Yeah, absolutely. I think that his profile of weaknesses were very consistent with his left MCA stroke and the neuroimaging findings of temporal and parietal involvements. Of course, there were other etiologies that we needed to consider. And so we went through that and some of the other medical conditions he has can be associated with cognitive impairment. One thing was his sleep apnea. That was more of a more recent development, he had not yet been on CPAP therapy yet. But my understanding is that [in] generally moderate to severe OSAs you would see probably more prominent impairment in episodic memory, more prominent impairment in executive functioning and inattention, which we weren't really seeing in his case. The other conditions we wouldn't maybe expect too much in terms of the way of cognitive impairment. His psoriasis, a skin condition, was being dealt with topically. The deep vein thrombosis had also been treated. His bilateral Bell's palsy was something that occurred 21 years ago, with no sense that it was an ongoing issue or there [were] any long-term complications from that. The only other thing was he did have this history of migraines. We know that pain and headaches can be associated with reduced cognitive efficiency. We tend to see those more in aspects of higher order attention or executive functioning. And, again, for the most

part, he does really well in those areas. So I felt we could pretty readily attribute his profile and aspects of impairments in expressive language quite rapidly to his CVA.

Ryan Van Patten 28:23



Great. If you don't mind, briefly run through recommendations with a bias toward highlighting recommendations that are individualized for his particular cognitive strengths and weaknesses and what relates to return to work, which you mentioned is very important in your setting and I really find to be important in rehab and in other settings. You had described his work as a manager of an auto paint and body supply shop. He manages employees, there's a lot of verbal demand in his job. So how do you think about tailoring recommendations for him given what we know?

Ronak Patel 29:01

Yeah, absolutely. There are several things I need to consider when I'm making my recommendations for any particular individual. The first thing that I often think about is where they are in their recovery. I'd seen him for the initial screening assessment several weeks after his CVA onset and then again one year later. We know that in recovery from acquired brain injury we can see some ongoing improvements in the 12 to 24 month mark. These tend to slow down the further we get out in terms of the rate of recovery from initial CVA onset, but I thought, certainly, given that there could be another year of some recovery and that he should continue with outpatient rehab as much as he could. So I certainly recommend that, if he can, he should continue with speech and occupational therapy because he was reporting that he was getting a lot from that and still felt he had a way to go. I really wanted him to capitalize on that in year two.



We also thought working with the OT, that they could start doing some functional-related activities that are geared to work. So in terms of what are some activities that he would have to do at work like writing emails, writing proposals for sales, or writing a report and to start practicing those at home. They had actually taken that recommendation and started doing that. Up until then, they really hadn't done anything specifically tailored to work so that is something that they started to do, where they started to draft samples of emails that he would have to write at work and engage in simulation-based exercises of different conversations he would have to have at work.

Then as it actually relates to guidance on return to work, overall, when we looked at his profile, he had a lot of strengths. Many areas are falling well within normal limits, including most aspects of executive functioning and episodic memory. Our opinion was that a return to work would be feasible, but given that he was in this managerial position and that there are these persisting language and speech

difficulties, I thought there would need to be some modifications in his role. One of the first things that I recommended was that he would benefit from an OT coming into the workplace to assess him and determine what modifications he might benefit from. That is something that they went through with in terms of having an OT workplace-based assessment done to identify how his position might need to be modified. As the gold standard with acquired brain injury, and given his reports of fatigue and decreased stamina, we advocated that he go back very gradually and in a graduated manner. So that would also be part of the OT-based assessment where they lay out a graduated plan, or graduated return schedule, so that he could ease back into some of his duties and responsibilities.

The other thing that we're asked commonly is somebody's ability to drive from the thinking perspective. We had no concerns. His visual spatial processing was fine, so was his information processing speed and set shifting skills. And in line with that, he was able to successfully reinstate his driver's license after it was medically suspended and he was able to get back to driving, which was great.

The last thing that we recommended was that he use compensatory strategies to help maximize his cognitive ability. So, certainly, even though his memory on testing looked fine, we still advocated for the use of external memory aids to help support and maximize his memory. He was using his phone, the calendar function in his phone, to keep track of events, to keep his to-do lists, he would write things down. So he had developed some really good compensatory strategies in his rehab therapy, and we certainly encouraged him to continue using those.



John Bellone 31:32

And, Ronak, you did some psych intervention with him. You did a few sessions of cognitive behavioral therapy, is that right?



Ronak Patel 33:38

Yeah. So one of the things that we highlighted in our report, in light of some of the psychosocial issues that he was going through and that were raised by his wife, was the possibility although he was within normal limits for his mood and anxiety symptoms and fine on the PAI that there was a risk, in the presence of this significant life event as well as the persisting kind of symptoms that he was having in terms of his expressive speech, that there could be a worsening of mood and anxiety. It was offered to him whether he wanted to participate in psychological therapy and so we had about 6 sessions during the graduated return. That's where I thought it might be most helpful because it's often a big step for individuals after they've been away for so long to have apprehension, to feel anxious, whether they can do it or not. I saw him through that time and we did a number of different things,

different modalities to help him reduce any stress or anxiety. In that vein, we were doing some mindfulness-based exercises, but most of our work was actually cognitive restructuring because he was really focused on the fact that he wasn't back to his normal and his speech wasn't back to where he was prior to the stroke. He really struggled with that psychologically so a lot of our work in therapy was to examine his thoughts around that and to recalibrate. To say, well, let's look at things and shift his perspective in terms of instead of making the comparison pre-stroke to make the comparison to when I first saw him and several weeks after his stroke and how far he had come along. There was a lot of reframing that was done. Ultimately, he did very well. He responded very well to that therapy and he was successful in his graduated return and is now working full-time and has been at work now for several years.



John Bellone 35:51

Is that common for you to do therapy? To have a few sessions with people after doing the testing?



Ronak Patel 35:57

No, it's not common.



John Bellone 35:58

[laughs]



Ronak Patel 35:59

We do purely assessment, we just don't have the resources to do intervention. It would be a great compliment if we could, but we just don't have the resources. In this case, his insurance provider had contacted me to see if I'd be willing to provide him with the psychological support that we had recommended. And, in this case, they recruited me privately to offer that service. They felt like I was in the best position to do it because I know him very well. I'd seen him twice for assessment and, at that point, I thought I was probably in the best position to help him have the best understanding of his stroke etiology and how that was impacting him. So I agreed to provide that service for him.



Ryan Van Patten 36:48

Great. Thanks for presenting the case.



Transition Music 36:50



John Bellone 36:54

Well, that does it for our conversation with Ronak. We have another clinical case with Ronak coming up, as well as episodes on cerebrovascular disease, digital cognitive testing, Parkinson's disease, neuropsych evaluations with children who are deaf or hard of hearing, and other topics. As always, thanks so much for listening. Join us next time as we continue to navigate the brain and behavior.



Exit Music 37:19



John Bellone 37:43

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Ryan Van Patten 37:54

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