Academy of PHYSICAL MEDICINE

Transcript

TMJ and Facial Pain
With Andy Toy

APM: I'm talking this evening to Andy Toy. Andy's a dentist. He qualified in 1980 and he's particularly relevant to our own professions in the physical therapy world because he's not only studied cranial osteopathy at the BSO, attended a course there, he's also gone back to teach modules at the British School of Osteopathy and subsequently has worked closely with osteopaths and chiropractors in dealing with not just his own models of pain in the head but working out how they interact with the models, the structure and function models that we're so fond of in our own professions. Back in 1982, he studied in The Pankey Institute in America, which is a world famous institute, which I'm not going to describe to you. I'm going to ask Andy to do that himself but first of all, Andy, welcome to the Academy of Physical Medicine.

AT: Thank you, Steven.

APM: Great pleasure to have someone who is so closely associated with our own professions here but tell us why this Plank Institute, Plankey Institute —

AT: The Pankey Institute.

APM: The Pankey Institute is so important. Why is this this Damascus moment for you?

AT: Well, Dr. Pankey first started studying occlusion back in 1926 when he decided he wasn't going to take another tooth out —

APM: Now, you've got to stop there and tell us what occlusion is because I had to look it up just to make sure —

AT: Well, by occlusion, we mean the way in which the teeth work together. Upper and lower teeth meet either in a static position or in a dynamic position.

APM: So it's also simply called the bite.

AT: The bite, other people call it the bite. If you come from where I am, it's the bite. So Dr. Pankey started studying occlusion back in 1926 because he was devoted to trying…helping people save their teeth, which in those days was quite revolutionary. And as a young dentist qualifying in 1980, I've just been taught about teeth and gums and I start to get an appreciation that there's more to this than just teeth and gums. There's the jaw joint and I've got an interest in looking at the patient as a whole individual. So somebody told me to go to The Pankey Institute, which is way across the…in Miami in the days before the internet. So I had no idea where I was going or almost no…why I was going but within 2 or 3 days of being at The Pankey Institute, I realized that they had taken the study of dentistry to a way way beyond anything I'd come across in dental school. So not only were they interested in the jaw joint but they were interested in the whole health of the patient and they took the whole health of the patient as being important and how it related to the dentistry. So from that moment on, I just wanted to study occlusion and all those things to a very great degree and I devoted a lot of my professional study to that through the '80s and '90s.

APM: You kind of surprised me there because I would assume that that's what all dentists do is study occlusion and work on the basis of how the teeth meet.

AT: Well, unfortunately not and it's not surprising, in a way, in the '80s for sure because the so called good evidence said that there was no relationship between the way the teeth meet and head and neck pain or jaw joint function because that work had been done with, you know, pharmaceuticals, use of pharmaceuticals and they were all into giving the patients drugs instead of any sort of structural, functional therapy. So dentists, you know, weren't taught that because there's not a strong evidence base for it but those of us who are clinicians, you know…intuitively, you know that if you don't put the teeth…meet together properly, something goes wrong and the patient complains something breaks or whatever. So we never, you know…although we rolled into an evidence based dentistry, we never really accepted that. So I spend a lot of time there and learning from different dentists but also, I got into working with osteopaths and chiropractors because I recognized that they were coming at this jaw joint from another position, if you like and their points of view and their experiences are just as relevant as mine and if we could work better together then we'll treat the patient better because we're treating them more holistically.

APM: So you've gone on from this too. You've now got a master's in clinical education, haven't you? So not only have you studied this in depth, you're now in the business of imparting this knowledge to others.

AT: Well, yes, I have and the other interesting thing about the mater's in clinical education was I got very much into the quality of evidence and in fact, I taught the research module for the master's for 10 years. And so I started to look at the evidence that we had for the way in which we treat patients and their occlusion and actually, it's pretty poor. And so it was part of my journey that when I came across a dentist who was describing a model of occlusion that was not, if you like, the accepted way and he appeared to have better quality evidence than the accepted way so it made me go down that route. And so if we get into the conversation this evening about, you know, how osteopaths might work with dentists, I think it's important for the osteopaths to understand, you know, what model of occlusion they're working on and the strengths and weaknesses of that and if we have the opportunity, I'll offer the evidence that we've got too on this new model of occlusion which is a development of that and I'd be really interested in any comments that come back from the audience then because I'm interested in testing this model, if you like and see how it makes sense…if it's a good model —

APM: That should be a real interest to our audience because, of course, we like to think we're all over structure and function. We like to think that it's not just the jaw joint that's causing a problem. Something else is affecting that.

AT: Exactly, yes.

APM: And it's actually very useful to think that we might be at the edge of new research into how to model this problem. So you talked about models of occlusion a moment ago. Tell us about those.

AT: Well, the accepted model which has grown out of basically circular reference started off with a chap called Bonwill in 1887 who…if you actually read the evidence, and it goes back to Bonwill, he wrote a paper back at that time and he stated that he'd been…he'd had a dream and he'd been visited by God and God had described to him the way in which the structure of the jaws and teeth work together. Now, we might laugh at that now but actually, in 1887 that was not necessarily about science you know. God was part of our world. Now, we, more rational now, might challenge that but…anyway, Bonwill described…God described to Bonwill exactly how the teeth and jaws were to meet and if we can show the slide that we've got here, you'll see here, I hope you can see this, that there's a…Bonwill described the proportions of the human body founded on an equilateral triangle and for the jaws and teeth, it was four inches in its side, four inches from one condyle to the other and four inches from one condyle to the front tooth. And not only that, it was exactly four inches. Now, Steven, that tells you two things. Firstly, clearly, God was English because He used imperial measurements.

APM: Indeed.

AT: And secondly, everybody must be symmetrical. Now, I can't question people's God but I can question the fact that the body, two sides of the body, are not symmetrical.

APM: We're not in the business of questioning anybody's god. What we're questioning here is whether it was actually really God who visited Bonwill back in 1889.

AT: Well, there you go. So it was Bonwill's big idea. Now, we might laugh at that now but actually, much of the thinking around occlusion today is based on Bonwill's big idea because a student of Bonwill was a chap called Angle, Dr. Angle and he described —

APM: You couldn't make that up, could you?

AT: Well, that's —

APM: Equilateral triangle and Dr. Angle.

AT: There's Dr. Angle and he described the way in which the teeth should meet together as being class 1, class 2 or class 3 and class 1 is the ideal and if you talk to orthodontists, many of them are taught to get the patient into class 1 but Angle got his ideas from Bonwill. Similarly then, there are —

APM: So what you just described is what we would call teeth meeting normally, an overbite or underbite, is it?

AT: Yes, that's right and so around about that time as well, if you study the development of the tools around occlusion, if you like, there's things called articulators which is the way in which the…they can set models up and move them around, supposedly like the jaw moves. There was a big argument around should we be describing the bite in structural terms or is that good bite actually something that's good function. Now, the functional side approach requires maths that didn't exist at that time. So partly because of the lack of maths to describe it and also because there were companies who were very ready to make these articulators because they could sell them, the structural point of view which is Bonwill and Angle, saying good bite is this sort of structure and it's symmetrical, that got the upper hand and then that developed and developed and to a degree was successful in helping patients but in my mind, does not describe the whole picture.

APM: If I can use Horacio here, what was the principle here? If you've got an underbite or an overbite and your jaw is correctly located in the

temporomandibular joint there, how do they propose to change the position of the teeth? Was it by movement —?

AT: Well, as far as the structural people are concerned, there's a particular position of the teeth and you have to get those teeth in that relationship, OK? But actually, if you were interested in function, it's not really the position of those teeth. It's how they move together and that does not require necessarily to be…have the upper teeth sitting over the lower teeth or one millimeter of overlap or five millimeters of overlap. You can have a range of structural positions but still have good function and it's one of the things that I learned from my cranial osteopathy studies, if you like because you never got absolutely symmetrical movements. When you put your hands on somebody, you had a range of movements but it was the balance of those movements that was important. It was different for every patient. So that's, you know…my perception of cranial osteopathy is it's a functional osteopathy, if you like, rather than searching for perfect structure. So basically, many dentists, if your colleagues are talking to dentists, they're probably based on this structural model of occlusion. It does get you so far and the way I like to describe it, if you look at it in scientific evidence terms then we have a series of facts and one fact might be, for instance, that the sun rises in the east and sets in the west. That's a fact. Wherever you are in the world, every day it rises in the east and sets in the west. Now, in ancient history, they described why that happened, was because God took this flaming orb from one side of the sky to the other and that helped them get through their lives and everything was fine then somebody around about the 15th, 16th century said, "Hang on a minute. There's no gods. These are bodies floating in the ether and actually, the Earth's in the center and the sun goes around the Earth," and that explained some facts. Then after awhile, people said, "Well, actually, if that's the case then it doesn't explain these other things. Maybe it's the Earth going around the sun," and that explained more facts. So the model of occlusion that most dentists are using is a bit like thinking the sun goes around the Earth and the model of occlusion that we've developed explains more facts. It's a bit more like, "Well, actually, it's the Earth going around the sun."

APM: What's the balance of belief in this then? I mean what's the percentage of osteopaths or dentists still working on the old model as opposed to —

AT: Well, if you're interested in occlusion, most of the teaching at the moment is based on that and that's partly because this new model of occlusion, if we get the chance, maybe we'll show the evidence for it, is still relatively new, like within the last 10 years and —

APM: But it sounds, from what you said, that there's greater evidence for this than there is for the old one.

AT: Undoubtedly, yeah.

APM: There's stuff for the old model with its poor evidence whereas —

AT: If you actually look at the quality of the evidence, it's basically case studies and it's explanations of things that have happened, believing that the sun goes around the Earth but actually —

APM: So you're fitting the evidence to the —

AT: When I look at it, I could explain it in different ways, if you like.

APM: So don't get too hung up on the fact that we're talking about dentistry models of occlusion at the moment because we are coming on to the very relevant temporomandibular facial pain aspects of this —

AT: Absolutely. It is really important for that, yeah.

APM: So where have we got to? You talk about these models of occlusion.

AT: Would it be helpful if maybe I talk about perhaps the approach that we've taken which is…we are far more interested in function and that you can describe good occlusion as, actually, when the patient has good function. So basically, if they can chew easily, they're in comfort and they can speak, really, that's…they can do that with whatever sort of bite they have then in my terms, they'd be a healthy patient.

APM: It does strike me that for a lot of the time, not all of it, when someone is biting and chewing, the teeth aren't even meeting anyway because there's something between them.

AT: They're getting close to meeting and actually, they meet very gently and that's what allows the muscles to fire off and that's part of the piece of research that we've done at Loughborough University as part of that.

APM: So where else is your research taking you now then?

AT: So in terms of the…I might begin to describe how we see the teeth and the jaws working together, actually. So I'm going to take you down to… I'm just going to show you some bones and I always thought that osteopaths like to see bones.

APM: We love bones, yeah.

AT: I've had some great anatomy lessons with osteopaths. That is one of the greatest things I ever did was spend time with osteopaths in anatomy. They're just brilliant. So I'm showing you some bones here and this is some place called Zola's tubercle.

APM: You better put in a good word for chiropractors as well.

AT: Chiropractors, also very good, yes, of course. Of course, yes. Keep the audience on side, you said —

APM: Absolutely, yeah.

AT: So this is Zola's tubercle. And just to remind you there, Zola's tubercle.is the place within the glenoid fossa that's in the maxilla there where the condyle is braced against the glenoid fossa. It's where the cartilage is thickest and also the bone is of greatest density. And that is an area, actually, and we believe it's the functional surface, if you like, of the condyle within the glenoid fossa. So when the jaw is in function, it's moving around that area.

APM: But there's a disc between the two.

AT: Right and then there is then a fibrous disc with nerves and blood vessels and elastic tissues at the back and then little muscles at the front called the lateral pterygoids and there's various other little muscles feeding into that disc assembly as well. Fits like a cap over that. So the concept of the new model of occlusion was that there's a relationship between the glenoid fossa and also then the biting surfaces of the teeth. You might call those the functional surfaces of the teeth. So hopefully, you can see this now and putting these little sticks on, there's a relationship between that plane there, X, this plane zed here and this plane Y here and that was the theory that we developed, if you like. Ron Presswood was the dentist who was working on this most closely. That was the theory that he felt there's this relationship that goes on and when all those functional surfaces is in harmony, that's when the patient is in greatest and healthiest function. Now, that's the theory. Fortunately, Ron is from Houston, Texas and his son… who happens to be Ron Jr. because that's the way they do it over there, his son was a NASA space engineer. So —

APM: You can't criticize him. You come from Wales. Everyone's called Dai.

AT: That's true, yeah, Dai —

APM: You've only got one surname. My mother's surname was Evans. So I can —

AT: There we are. You can do that. So anyway, Ron Sr. was talking to Ron Jr., his NASA space engineer son, saying, "I think there's a relationship between these functional surfaces," and Ron Jr. said to him, "Well, if you're right then we should be able to describe the maths. We should fin the maths."

APM: Can I just, before you go on, look at…the slide you brought up there; it's hard to picture those planes. Are they perpendicular planes as in X, Y, zed on a normal axis?

AT: No, they're not. You see, they are varying axis and I'll show you in a minute how that works together. So —

APM: They're all fixed in relation to each other, aren't they?

AT: Well, that was the theory. So Ron Jr. said, "If you are right then we should be able to find the maths that describes that," and it's non-linear maths, you see and that sort of maths didn't exist around the time of Bonwill and Angle. So basically, they got a load of 12 skulls and they scanned those with some pretty heavy computers and they put that to an engineer and said, "Is there a relationship between these three planes?" and those of you who are into non-linear maths —

APM: Don't get scared by this.

AT: There you go. So that's a load of hieroglyphics to me but to an engineer, it's a beautiful being. And there is a relationship between the functional surface of the jaw joint and the functional surface of the teeth and that describes any size of skull. So in terms of evidence base, for me, you cannot get stronger evidence than that. So whatever the study showed in the '80s, they were wrong.

APM: So this is the TMJ trajectory, how the TMJ…how the condyle of the jaw moves against the —

AT: In function, yeah.

APM: The glenoid fossa.

AT: That's right, exactly that, yes, that's right.

APM: And before you get your certificate this evening, you will be asked to write out that equation in full from memory.

AT: Well, it's only part of the equation and it's also —

APM: There's more.

AT: Commercially sensitive actually. So I'm going to move on quickly from that before you do write it down. And actually, it describes a spiral and each spiral is a parabolic curve, I should say. Each parabolic curve, of course, is different for each side of the body because the two sides are not symmetrical as we

know and this proves the fact that the function is asymmetric. So the challenge that —

APM: I never got taught of this at college.

AT: There you go. So OK, so maybe we are learning something together. So —

APM: Well, nobody is…it feeds into an awful lot of other theory, as we said earlier on. I don't think it's my own theory but I rather resist the fact that in many practices, people try to force people into what they think is the ideal posture but there isn't an ideal posture.

AT: Exactly.

APM: There's your posture and my posture.

AT: Exactly that.

APM: And it might not be symmetrical for you on either side.

AT: Exactly.

APM: … the same as mine

AT: Exactly that and that's what I picked up from the cranial guys you see, which…anyway, so that's the way we believe that the body or the jaws work in relation to the occlusion. Now, this has some consequences and…maybe, again, I'll show you in a minute how that affects how people build dentures but dentists will be trying to create a symmetrical bite and that's sometimes…some dentists then do very, very destructive dentistry in order to achieve that and that I think is where it's seriously wrong and unethical.

APM: Destructive meaning?

AT: They cut the teeth down and build new crowns or new teeth, if you like, to fit to the patients and at great expense and obviously, you know, damaging the teeth. One of the things that made Ron Presswood say, "I've got to do something about this," because there was a lot of that happening in the States. I have to say we're a lot more conservative in the UK. So that doesn't tend to happen as far as I'm aware in the UK too much.

APM: I kind of get the impression the Americans put a lot of emphasis on aesthetics as well as —

AT: Yes, they do. They're aiming for perfect tooth structure as well of course.

APM: But in terms of getting that perfectly symmetrical bite, how do you do that? Is that where you stick the dental sticks in people's mouth and make them bite down on it and see which ones get squashed first?

AT: Well, there's various ways, including some very technical ways with computers and stuff like that and they are basically trying to move…and often with orthodontics as well in moving the teeth to the point where people are being offered surgery in order to get this ideal bite and fortunately, a lot of people in the UK refuse surgery so they don't get that level of butchery, if you like. But, you know, these people who are prescribing this are doing it on the basis of their own theories and they believe themselves to be doing it right. Now, fortunately, the way that most occlusely orientated dentists will treat patients if the osteopaths sent them to a local dentist that is interested in occlusion is they'll fit a bite splint and that's a piece of plastic that fits over the lower teeth and you modify the bite in the surface on the plastic before you do anything permanent to the teeth. Now that's really important and what those dentists think that they're trying to achieve is something called canine guidance where the front teeth will ride up and down on the big canine teeth and that's where our model and their model separate because we believe it's what's happening on the back teeth that's really important, not what's happening on the front teeth. However, what these dentists are doing is generally freeing the function up and I think why…the reason that their splints are successful…if they make them flat enough and free enough then it allows the jaw now to function, which then switches the muscles on. So —

APM: This is a splint, which is worn all the time or is this —

AT: Well, it depends on the dentist but they would generally fit over the whole surface of the lower teeth or the whole surface of the upper teeth. We would ask the patients to wear them at night and it's a bit like an orthotic in the shoe, you know. If they're doing lots of weightlifting or working heavy things then it might be clenching, you put on during the day as well. And it's designed then to change the information that the brain is receiving from the —

APM: Now we're talking my language, yes because for me, orthotics, you wear them more…we don't wear them in bed, actually but you wear them all the time when you're on your feet because you are sending that proprioceptive feedback to the brain.

AT: It's about proprioceptive feedback, yeah.

APM: I've not come across this. This is something that someone can wear all day and eat with this splint in place.

AT: They generally take them out to eat. Now, I'm talking about the dentists who are interested in occlusion. They will fit one of these appliances. They're in hard acrylic and they design to feel like the patient's own teeth. The standard approach that they would get from a hospital or an NHS dentist will be a soft, squidgy thing and they throw that in the mouth and then often, they send them in the post. They don't even see the patient to fit them and it just changes the proprioception of the patient for a few weeks and they seem to get better.

APM: Is that rather like the mouth guards we used to wear as kids in school in Rugby—

AT: That's right, yeah.

APM: --where you stick them in hot water and then try not to scald yourself while you mold them with your teeth.

AT: Quite a bit like, yeah.

APM: Why would someone have one of these fitted? What have they gone to the dentist complaining or has the dentist simply said, "Your bite's not symmetrical. You need one"?

AT: So they will have complained…they'll have odd pains in the face that can't be explained by something else or they've got a click or maybe headaches that, you know, their GP has sent them along to the dentist because they can't find any other reason. You often find, you know, those are young patients who are going through their exams, they're under stress and if we're going to get into how I deal with people with facial pain then I always say to the patients, "Well, we have to understand that all pain is felt in the head and that part of the reason you may have pain is because of bad signals that are coming from your teeth or the muscles or the joint but also there's an element of emotions affecting the way in which you feel pain." So if you're particularly anxious or you're very tired, you know, it turns the pain up, if you like. It amplifies the pain. So I try and get the patients to understand, particularly the chronic ones, that just changing something physically may not be sufficient to help them with their problem.

APM: The first thing I'm taking away from this actually is part our own case history taking. When we've got people who've got headaches and so on is to ask what management they might have had from a dentist because what you're going to tell us this evening may help us make use of that information to—

AT: Definitely.

APM: --either support it or suggest alternatives.

AT: Have they had any dentistry recently, whether that be a tooth out or tooth moved with orthodontics and there's a lot of orthodontics going on now or —

APM: Is that on the increase?

AT: Undoubtedly, yeah.

APM: We're after the American model as we are —

AT: It's going to be huge. It is huge already. So —

APM: Is it too early for us to get out of the rabbit hole of how orthodontics might adversely affect our —

AT: Well, most orthodontics is actually designed to improve the appearance. So actually, most orthodontics is going from crooked teeth at the front and splaying them out a little bit and guess what, it's given them a little bit more freedom and I think it's the freedom that's better for the jaw joint rather than them being locked back. Except for those orthodontists who are forcing these patients into a class 1 bite which sometimes is locking them back and then that's when you might find that they get heavy contacts on the front teeth and it forces the jaw into an unstable position and it switches the muscles off. We do know that but —

APM: So it switches the muscles off which slightly surprises me because I would've expected the muscles to switch on hard to try to overcome the problem.

AT: No, we…another part of this story is we did a lot of research in Loughborough University at the Department of Health and Sports Science there and we've done EMG, electromyograph studies and in fact, more EMG studies than anywhere else in the world on the masseter and temporalis muscles and we did different types of bite. We modified the bite of the subject and then we measure the muscle response to that.

APM: I've actually had somebody ask this question, Sarah in London. Do you think…maybe using the skull here, could you demonstrate what the TMJ is thought to do? What you expect the TMJ to do, how should it move?

AT: Well, if you look at the…yeah, that'd be interesting.

APM: This is not a simple hinge, is it?

AT: It isn't, no. So your TMJ has two…well, this is interesting. You see, if we were describing it in terms of teaching, we describe a rotation movement which is simply a hinge and that's up to about the first 20, 25 millimeters of opening at the teeth, interincisal opening and then after that, it does a translation

movement where it rides down the glenoid fossa. I'll point it there. So it's riding down and that's when it's going from rotation to then riding down and you'll get the extra 10, 15, 20, 30, 40 millimeters of movement sometimes. So there's rotation and then there's translation.

APM: And somehow, there's a parabola in this.

AT: Well, but in real function, the jaw joint is actually…the condyle is actually doing this and when they're really clenching, it's actually a relatively small movement. So one of the challenges that we've had in terms of our…the way we're being taught, nice, smooth gliding movements but that's not the way the jaw works. The jaw works like this and our model understands that and accepts that and works with that and that's where having good, strong, balanced muscle function becomes important.

APM: Balanced muscles of…?

AT: Of mastication, so —

APM: Which would be which ones?

AT: Well, I mean the primary ones are the masseter and the temporalis and that —

APM: Are you talking balanced side to side or balanced within the muscles on each individual side?

AT: Well, within each joint, yeah but both sides as well and if one of the…the differences between our model of occlusion and the one that most dentists are following if they're into occlusion is they believe it's important to switch muscles off. That's part of the way that they've been taught and whilst I certainly believe that's necessary if somebody's in acute pain and, you know, the joint just needs to rest, you've got to rest it, that's fine for the first few days but I mean I've damaged enough joints in my time and when working with physios —

APM: In patients?

AT: No, my own joints, I should say. Thank you, Steven. Well, I hope I haven't damaged so many joints but we'll see. But anyway, when I'm working with the physios or the osteopaths, you know, they've been all talking to me about get good motion, good function back, strengthen the muscles around the joint which will stabilize the joint. So one of the things that used to trouble me was, "Well, why am I trying to do the opposite for a jaw joint? What's so different about the jaw joint?" but actually, with this model of occlusion, we see and we translate that into clinical practice, when you do strengthen the muscles around the jaw joint, you find they do become more

stable. The clicks go away. The opening improves and the pain reduces. So that's one of my pieces of evidence from my own clinical practice, if you like, that makes me feel that this model is the more appropriate one.

APM: Another one of our audience has asked a question, this time about the emotional side of things, which you mentioned earlier on. It says, "Do you find that people who have TMJ pain or occlusion problems have some kind of emotional involvement? Do you see any patterns or type of emotional problem? Do you recommend counseling or anything else like that to support what you're doing?"

AT: It depends how extreme the problem is, how long it's been going on. I'm always trying to under promise and over deliver when I first meet a patient and I do recognize that we are a team that works together and I do need to understand the patient as a whole person. So part of my questionnaire will be, you know, what emotional stressors have they had throughout their life and what…particularly recently. So, you know, is it bereavement, divorce, that sort of stuff. There have been some studies to show that people who have suffered abuse as a child are more likely to get chronic pain syndromes. You've got all of that that you would throw into that as well but those who've had a long term problem, they've been to many, many dentists or many physical therapist and they don't seem to be getting anywhere, you know, they are in a pit because they don't think they could be cured. So you have to understand where they're coming from from that respect.

APM: There's a paper from the early 2000, I think 2004, Shafer and three others. It was a meta-analysis of the best evidence they could find which I think said that CBT and other psychosocial controls had a role to play but I think that's probably common to all pain, isn't it?

AT: Absolutely, it is, yeah and, you know, head and neck pain is no different to that.

APM: Another question, can the discs get damaged or can they lock?

AT: Yes, they can. The discs can get damaged and they can tear. They can actually become completely disengaged from the elastic tissues at the back; in which case, they sit forward in the joint. I'm not sure if we can show that here. They'll sit in front of the condyle and that will be one of the reasons why you can only get rotation movement, which is up to, say, 25 millimeters. If a patient can't go beyond that, there's no translation because the disc is in the way. So that's a pretty severely damaged disc.

APM: Fixable?

AT: Well, yes, it is and there's not a lot of jaw joint surgery going on. I happen to be in an area where we've got one of the leading European jaw joint

surgeons and they are quite keen to get in and repair that disc but actually, you find that often patient's discs will repair themselves. So over time, they will start to get more movement back and if you look then in the cadavers, you'll see that what was nerves and blood vessels and elastic fibers then becomes more fibrous and becomes a pseudo disc, they call it.

APM: And the joint then reseats itself correctly?

AT: And the joint will remodel and —

APM: Funny old thing, isn't it?

AT: It's fantastic. That is really what gets most dentists out of trouble is that whatever we do to the teeth, most patients adapt to it and the anthropological evidence we have —

APM: You heard it here first, whatever the dentist does to your teeth, the body will fix itself.

AT: Well, thank God, they do as long as you don't take them beyond that ability, that adaptive capability and it's partly anthropological evidence we have for our model of occlusion. There's a lot of anthropological evidence to show that.

APM: Let me ask a couple of other questions before you get the chance to move on. Can TMJs get arthritic? And for example, can you get osteophytes —

AT: It's very, very rare. And when I look at x-rays of TM joints…in the past, you know, we've looked at them and they've gone from this like nice, rounded…actually, they're ovoid, they look fairly round on an x-ray and they're going flat. We used to open our hands up and say how terrible that is but actually, now I look at the patients, I think, "Well, they've just adapted that. That joint's adapted to their function," and just because it's that shape doesn't mean to say it's a bad thing but it is very rare.

APM: There's a chance that this question is more related to personal issues, child issues than what we want to talk about which is TMJ which…but is there a link to crowding and tooth decay and do people who have orthodontic work as children have less chance of decay? That was Fiona who asked that.

AT: There's no link. So the orthodontic appliances may act as a plaque trap, so you're more likely to get decay. There's a risk of that or very, very crowded teeth are more difficult to keep clean. That certainly would be the case for older patients but actually, to be honest, the rate of decay is related to their level of fluoride they've had in their personal environment in the early years and then their diet, their frequency of sugar intake, basically but —

APM: Which is, of course, big news at the moment, isn't it? Trying to reduce sugar.

AT: It absolutely is, yeah. The quantity but also, they should be reducing the frequency of sugar intake as well.

APM: This is not what we're here to talk about. I'm slightly puzzled about this idea that sugar softens the enamel. I thought the enamel is like chromium plate and it —

AT: So enamel is this crystalline structure but the sugar is used by the bacteria and part of the substrate from that is acid and the acid will erode the crystalline structure.

APM: Eroding it, yeah.

AT: Erosion, yeah.

APM: And is there some truth in the idea that if you've just eaten sugar, you shouldn't clean your teeth straight away —

AT: There is actually, yeah because it's better to get rid of the bugs before you have the sugar because you need bugs and sugar. The other aspect that we've got nowadays though, of course, which is affecting young people is the availability of acidic drinks, so fizzy drinks, so instead of having the bugs to create the acid, you just put the acid in and that really is wearing the teeth down quite quickly, actually. That's a bit of an epidemic going on as well at the moment.

APM: Strange that, isn't it? You'd have thought…I was under the impression that dental health was improving until the news recently that actually it's getting worse because of fluoride in the water —

AT: But it has. It has significantly improved but unfortunately, there are small pockets, usually the lower socioeconomic groups where it's getting seriously worse, yeah.

APM: So just finish this question off before we move. Do you see particular facial pain patterns with TMJ problems? Are there any that we might misdiagnose? That's a really good question, isn't it?

AT: It is. So I'm a big one for trigger points and Travell's referral patterns and if you're familiar with that, you know, it's anything from the shoulder girdle up, basically and that the…because we know the way in which you bite does affect the muscle function and in my model, it's a lack of function that leads to pain. That's certainly been my own personal experience. We haven't told them, Steven, I broke my —

APM: Actually, I meant to mention that. You struggled all the way down here into our studio with a broken —

AT: I have indeed. I'm a real hero.

APM: Broke it skiing so you get no sympathy.

AT: Exactly but the pain I'm getting is actually from the muscles I'm not using and of course, I'm having, you know, acupuncture and physical therapy to get those muscles working. Well, why are the muscles of the head and neck any different? And we know that certain bites switch muscles off. So we want to get those muscles working, want to get that joint moving in order to allow those muscles to work and —

APM: So what are those typical pain patterns you'd expect from a TMJ?

AT: Well, we should talk about orofacial pain, actually because the TMJ itself, you know, that pain from the joint and so when I see a new patient for this sort of thing, I'm thinking about, "Is this a muscle pain problem or is this a joint dysfunction problem?" So I'll do some measurements of the joint. Is it just rotation or is there translation as well? So that tells me something about the disc and where it is.

APM: How are you measuring that? Because I'd stick my finger in their ear, more or less and just feel what the joint was up to and I'd watch the midline of the jaw to see whether it was wobbling.

AT: Exactly. So if the condyle's above translating evenly then you know that the disc is probably in the right place, pretty much. If one goes like this then it tells you this one's clogged up. This is rotating only, so there's a problem with the disc on that side and similarly, that way, there's a problem on the disc on this side. So that, I'd be thinking, "Is this a joint problem?" That'd be part of my diagnosis for that. The other thing that I do is I place my thumbs here, my fingers under here and I load the joint. So I push up there at the angle of the mandible. I'm loading the joint and I'm asking them, "Is there any pain here?" because if there is pain, it tells you that that condyle is actually sitting on that nervous vascular tissue. So that is very rare, actually, because I just say, "Is there any pain?" and they say, "Yes, down here," then I know that this joint's OK but that will tell you something. So is this patient's problem a joint problem or is it a muscle problem? So then there's various pains that they're getting there. I'll then apply some pressure to the main muscles of the head and neck and I'm feeling for trigger points. That's one of the things that I learned in part of my studies with people like yourself and can I feel a trigger point and if I press on it, does that give them the sort of pain that they're experiencing. To be honest, I go at them very gently, especially if they're in chronic pain. You can feel the tissue before you know whether it's going to be painful. I don't need to give them a whole load more pain.

APM: Someone of these evil buggers out there says can you demonstrate the trigger points on me.

AT: That's often… If I had a good shoulder, I would, so I'll let you off.

APM: As you say, one of the people we've had to lecture on courses is Simeon Niel-Asher who is…I would say he's a world authority on trigger points as well as shoulders and there's a particular trigger point under the scapula, below the spine which on me, you'd have to scrape me off the ceiling and he finds it within a millisecond of the time.

AT: He is evil, obviously.

APM: Yes he is evil but…so you're palpating around masseter, temporalis as well?

AT: Masseter, temporalis. I'm doing external pterygoid. I don't do lateral or internal pterygoid anymore. It's always painful. I'm not actually sure I'm getting there anyway and with these chronic pain patients, I don't want to be giving them more pain. I want to be getting the sense of can I feel some nodules, trigger points in the muscles but also how do they respond to pain? And if they're leaping at the first touch then I know we got a really hot patient here. The emotional side is really, really significant.

APM: Interesting to hear because I said to you earlier on, quite coincidentally, long after we booked you, I actually got a TMJ patient I think 10 days ago and I don't see very many TMJ patients but I did work internally to try and solve and it was very gentle work and it seems to have been effective on her and—

AT: Yes, yes.

APM: --because I treat so few of them, I'm always a little bit suspicious that it may not work but…

AT: So therapeutically, I can see the value of that and…but in terms of the diagnosis, I'm not too concerned. Now the other thing that I do is I want to see if their bite has something to do with their problem and because I…whilst I've learned kinesiology and cranial osteopathy, you know, I don't use those techniques in my practice. I'm a dentist. People expect me to be a dentist. I'm certainly not skilled at them unless I'm doing them all day every day, which I'm not. So I'm thinking now, if I can…I can only help you if there's a dental part to your problem. So I want to see if the way in which they bite their teeth together makes a difference in their muscle function. So that's where then I would look carefully at the teeth. Is there any signs of damage to the teeth that might imply that the bite is wrong on one side? Is there any mobility of the teeth? Do they move? When they tap their teeth up and

down, do they feel one tooth is hitting before another? And particularly, do they feel that their front teeth are in contact?

APM: There's several hundred osteopaths and chiropractors who will just —

AT: Tapping away, yeah. One-way you can do that—

APM: You did, you know you did.

AT: --is you put your finger on the front teeth with a glove on, obviously, and you ask them to tap up and down and through the fingernail, can you feel a little vibration? And that's called fremitus and in our model of occlusion, we'd say that would be bad because we know that when the front teeth touch, it switches off the temporalis to…and it switches off the masseter to a degree and we believe that's a bad thing because that will lead to instability in the joint. So that will be the sort of things I'm assessing this patient for. Then finally, I'll then do my own EMG studies. So I use my fingers as the electromyograph probes and I'll get them to close their teeth together and do an isometric clench. So just clench and I'm feeling whether those masseters are firing or not and whether they're firing equally or one at a time or one before the other. I'll then do the same to the temporalis muscle. Now, if you remember your anterior temporalis muscle, it's actually quite a thick muscle and invariably, this temporalis muscle is barely moving or you can feel a little quivering. So what you do then is you put some cotton rolls or you could use, as osteopaths, maybe a little bit of cotton or a gauze and a little bit both sides on the back teeth.

APM: How thick are we talking?

AT: Maybe —

APM: Pencil thickness or…?

AT: Less than that, I would say, perhaps half of that, 2, 3 millimeters, something like that, something to separate the front teeth. Get the patients to bite then and then see if the…you then got more even and greater volume of contraction, particularly up here and I then get the patients to try that themselves and if they can feel a difference as well, I know then that we probably…if we alter their bite, we are going to make a difference to their muscle function which should then relate to reducing the sensory load that that brain pain center is getting which, hopefully, will do something to their experience of pain.

APM: So that's something that an osteopath or a chiropractor could be doing in their own clinic.

AT: Absolutely.

APM: Several other questions that came in earlier about how do you…or how you work on muscles, what do you do to then train these muscles and —

AT: Now, again, you know, whilst I've had courses on trigger point therapy including dry needling, I don't do it all day every day. So I would refer them on to an osteopath, chiropractor who I know works. I'll be honest with you, I don't like big bone crunching type Osteopaths and chiropractors but I think the modern way now is, you know, perhaps a little bit more using soft tissues and gentler techniques and mobilization techniques. So I'll refer to them or a physiotherapist or a sports massage person to get to work on the muscles but if I think the bite has something to do with it then I'm going to fit an occlusal splint to say, "Well, let's try developing your own bite so we get these muscles working in this way and let's see what happens," and it's a reversible procedure, this is very important, because if you don't get on with it, if you don't like it, I've done nothing permanent to your teeth yet and I think that's…and certainly, within…they want to be working with a dentist who's very keen on doing reversible procedures to begin with.

APM: But how does your splint differ from the ones you talked about earlier on which you said may not necessarily be addressing the whole problem?

AT: Right or if it does solve the problem, it's because of a different reason, OK? So they may look the same, they generally…bits of plastic that are often tooth colored, they'll fit the whole biting surface of the top teeth or the bottom teeth but my splints are all about getting good muscle…good tooth contact on the back and when that patient slides from side to side a little bit then it's all in contact at the back. The traditional way is to have good contact on the front and when the patient slides from side to side a little bit, it rides up and down on the front and it comes away at the back. So they think it's what's happening here that makes the difference. We're saying it's what happens here that makes a difference and we call our model of occlusion posterior guided occlusion. So these dentists who are thinking it's all about the front, what they don't realize that under function, the joint actually distorts a little bit and when that patient really grinds on that splint, those back teeth are coming together and what that splint's really done is allow the patient to move around and develop that good mobility again which we think is good part of joint health.

APM: Take away the splint, does that mobility remain?

AT: Not necessarily because probably their occlusion, the way in which they bite their teeth together has locked them in and not allowed them to make those movements. So you open them up a little bit and flatten it and it allows them to move around and that's why those other dentist splints are working. Some dentist splints will just have a little jig on the front teeth and that does switch the muscles off and calms them down to begin with but I don't think that's

good long term because ultimately, you're going to get the teeth moving because they're not all covered and you might get the joint changing shape as well.

APM: But you said it switches the muscles off which is fine in chronic —

AT: Acute.

APM: In acute pain.

AT: In acute pain.

APM: What you want is to switch them on and strengthen them equally and appropriately which, of course, is what people are driving at here, "How do we do that?" You'd say you got to find someone who knows how to do that muscle development. So if there's anybody watching, physios, chiropractors, osteopaths who specializes in this area or is experienced in this area, do send in your ideas for how you'd strengthen those muscles because it's a fascinating one for me.

AT: We you prescribe isometric exercises as well and, you know, it depends how significant the patient's dental bite is to their problem, to be honest. So to be honest, sometimes I think just sitting down and talking with them and helping them understand what's going on, maybe giving them something, like a splint, but they're probably getting better anyway just because they've got someone who has listened to them, you know, and we all know…and I'm sure your colleagues have the same that the average medic doesn't have time to listen to them. You and I take a really good history and there's a lot of the healing that's going on in that —

APM: Indeed and I'd like to think that none of us has lost sight of that.

AT: Exactly.

APM: That sometimes, it's not what we're doing, it's what we're saying or what we're listening to which is making the difference. Excuse me if I'm wrong here but somebody's asked the question, "How do you measure or test the balance between masseter and temporalis?" and I think that's the digital EMG. If we didn't explain that clearly then do come back to me and we can go through that one again. Is there a link between dysfunctional TMJ and dizziness or is it more likely that the forces from the TMJ resolve around the cervical spine, which may then lead to dizziness? Do you know?

AT: I actually don't know but I suspect it's the effect on the cervical spine muscles myself, yeah. We know I mean just mechanically they're all connected from the shoulder girdle up, never mind all the fascial planes and all that sort of

stuff. So I don't see why the TM joint should have any effect…direct effect on people's balance perception —

APM: The paper I mentioned earlier on, Shafer and a number of colleagues, again, I think it was a meta-analysis but they identify particularly that cervical spine was intimately connected to TMJ problems. Now I don't know in your work with physical therapists. Have you identified a common site of dysfunction for that or just common patterns of dysfunction?

AT: I've not studied enough or done enough to know what's common but I do know, you know, when we get the bite right that they can move their head and neck more easily. We've seen that. We see that in the courses that we do and that's what patients and chiropractors and osteopaths report to me. So often, they'll send me a patient. When they're doing a correction, seems to go great for a few days and then it seems to go wrong again. So there's something just tipping them back to where they were before and that's when they start to think, "Well, I've corrected it but it's not stable. Is it something to do with the bite?" and they tell me, sometimes that yes that makes a difference. They like what I do. And I assume that we've just started to get all those muscles working but I don't know enough about it. I'd go to your colleagues to ask that question.

APM: A question here is about the click, one that you mentioned, the click, earlier on. Is it true that an opening click is fixable… my question has disappeared, is it fixable whereas a closing click is not? What's making the click? Is that —?

AT: So there are little ridges on this disc and the click, we think is as the…when it goes from rotation to translation, its just riding on to the disc. The discs probably come forward. It often comes forward and medially because that's the action of the lateral pterygoid or the internal pterygoid. So it's come forward slightly, not necessarily fully forward because then you wouldn't get the translation but it's partially forward and it's clicking on…the click is when it engages, the disc engages fully over the condyle. There's a big classification system around clicks. I can't remember it and actually, I look at the patient and think, "Well, actually, a click on its own is not bad anyway." I've got lots of patients…one of the things that…because I started in 1982 with this, I've looked at TM joints of all my regular patients and some of them, I've been seeing for 35 years and some of them got clicks, some of them got deviations. As long as they can chew well and they're comfortable, I've left it at that but the click is only one of the signs that tells me that this isn't a super perfect joint but…now since I've got —

APM: But there's plenty of people who've got clicks who don't have a problem?

AT: Exactly, yeah. So one of the things…and I used to…with the old model of occlusion I was following and saying, "Well, I'm never sure on clicks. I'm not going to guarantee we can get rid of clicks," but actually, since we've started

really getting the muscles working in a deliberate way, I'm finding that most clicks go away now as it happens. So I'm starting to feel a bit more confident about clearing clicks but a click on its own, I don't see as an issue. It's just if it disturbs function or comfort.

APM: So it seems to you that the muscle work you've described is likely to fix that clicking problem.

AT: I'm finding that in my clinical work, yeah, more commonly, yeah.

APM: And I think the answer to the question is…well, you haven't given an answer to the question. An opening click is fixable and a closing click is not. It sounds —

AT: I don't see it like that.

APM: It sounds as if they are both the same cause

AT: Well, it depends on where it is in the translation and it may be somebody's done a fantastic study and say, "Yes, it is," but I don't personally see it like that and I do question most of the evidence that, you know…the evidence that we use in our clinical practices has really come up from somebody's big idea. Well meaning people who think, "Well, I've tried this and it seems to work," and, you know, sometimes they then build a whole course around it and, you know, you can imagine all the shenanigans around that but most of the evidence, clinical evidence is pretty poor really.

APM: I was very surprised to see, when I was preparing for this interview, actually, there is not a lot of available evidence out there certainly for the intervention of physical therapists, maybe more in the dental line, I don't know. One of our viewers has asked whether you've seen an increase in TMJ problems over the years. I guess my add-on to that is have you seen an increase because actually, you developed an interest in it and therefore, you find them more often.

AT: Well, exactly. I came back from the Pankey Institute and my first week, you know, everybody had a bite problem. So then I started, hang on a minute you know. It's like if somebody buys a red Mini and there's red Minis everywhere. So I can't say that there's necessarily been an increase. I mean it does affect a significant number of people and one of the tricky things about TMJ type issues is that usually, they resolve themselves. So if they've been to the dentist and had something done and they've got better, we still don't know whether it was the dentist's intervention or it just got better on its own which is why these little squidgy splints work I think because the patient's going to get better anyway but there are, you know, a fair number of individuals and some people have put it up to 25% where this TMJ problem keeps coming back and that's where you've got to think about intervening

then. So I don't think we can say it's increased, particularly, other than maybe the patients becoming aware of it because the internet and they go on and they come in and say, "I've got TMJ, you know. I've looked it up," and stuff like that. So they're becoming aware of it and they're thinking more holistically as well, if you like. So they're joining things together.

APM: One of our viewers has asked what the best courses are for intraoral work and obviously, they're thinking along the lines of manual therapy. Is that something you can advise —?

AT: I can't. I'm not in the field well enough to comment on that. First of all, I would like to think that, you know, they're taking the patient as a whole. They're understanding the whole role of pain, chronic pain and stuff like that. They would be relatively gentle, I suppose. Well, my physiotherapist and I…I know he can't be that gentle all the time, an understanding where…and I'm sure your colleagues are like this but it's not just fixing one muscle. It's understanding how they all work together, you know, within their individual system and part of the body as well.

APM: Well, one of the things that I found fascinating doing what I'm doing this evening is I'm getting a much greater range of CPD input than I would have done had I just been going on courses and this isn't me just trying to sell APM to people. You all are members anyway but a few weeks ago, we had Leon Chaitow. Not the most recent Leon Chaitow interview but the one before that and he was talking about respiration and he was talking about how the psoas muscle which actually affects the hip affects the scalene through its effect on respiration and now you're telling us, well, the TMJ is actually going to switch on, you know, some muscles which will affect the cervical spine or vice versa and possibly, I'm thinking, well, maybe that's going to affect the scalene as well—

AT: Absolutely, yeah.

APM: --or other muscles of respiration

AT: Absolutely.

APM: So it's fascinating to put all these links together and hopefully, somewhere amongst it all, we can genuinely address things holistically which is a term I hate but there are some times when I think it's appropriate and I think it is when we can link all those bit of anatomy and function together.

AT: Understanding the links. It's a Pandora's box as well, of course, isn't it? Because so many where do you stop and where do you start.

APM: And as you say, you learn to do something and all of a sudden, everybody needs it.

AT: That's right.

APM: One of our viewers has said that this all sounds very expensive, what you've been talking about and is this treatment available on the NHS?

AT: On the NHS, they'll give you a squidgy splint. That's it.

APM: Ok.

AT: And in my area —

APM: Which you can probably buy yourself cheaper than you get it from —

AT: Well, you get a version, yeah. It won't be as good as that I expect but then…or they'll refer you to maxillofacial unit at the local hospital and there's very few TMJ surgeons around. So maybe they'll do a little flushing of the joint or they'll talk to you about exercises or they'll get you on to a pain clinic but they'll probably put you off for a long time, to be honest, because we know how much strain they're all under and all they will try to treat is —

APM: And statistically, a lot of these things fix themselves.

AT: Well, exactly, yeah. So, you know —

APM: Because by the time you've gone to somebody with this problem, it probably hasn't fixed itself for a while, so they're already into the chronic stage, aren't they?

AT: Chronic phase, yeah, absolutely.

APM: So I think the answer to that question is that in theory, the NHS will treat it. They might not treat it according to the latest models of pain and dysfunction and if they do treat it, it's going to be a long-term job.

AT: Yeah.

APM: Well, you suggested earlier on that actually, surgery may not be the answer anyway.

AT: Well —

APM: It wouldn't be your first response would it?

AT: I mean I would be…I would always want to keep a surgeon out of my body if I can help because I'm surgeon, so, you know…and particularly elder joints. And so I would always go for the less invasive option and Ron Presswood

who's been doing this sort of work, obviously, for a long, long time over there in Houston, we did an audit on his chronic pain patients in over about 20 years and he's a Pankey dentist as well. So his records are absolutely brilliant, OK? So he's got these fantastic records and we had a good look at the records and there's about 80 patients in there that we looked at and he's, you know, got evidence of…his patients, about half of them were referred by neurologists and the likes, so these people at the end of the line basically and they get to see Ron and he has got something like a 90% odd success rate and the average improvement time is about 7 to 10 days, so some of them within 2 or 3 days of having years of pain. Once you start to get the muscles working, plus they feel understood, you know, and all those things, they are getting significantly —

APM: And you're doing what he does.

AT: Yeah. So —

APM: So we expect the same degree of success in your —

AT: Well, I'm doing OK but I always try to under promise and over deliver because I tell the patients up front, "There's no science behind this but we tried this look and it seems to make a difference," so we try that. The next step is to try it in hard plastic. Thankfully, most of them get better. Their pain experience reduces and their muscles start to work better and whatever else happens and they can wear that splint less and less and less and I don't need to do anything permanent to their teeth. So that's another —

APM: And have you got favored physical therapists near you who you know can address the muscles around this joint? Yeah. This is a really interesting question. The one thing that strikes me about the TMJ is that it's a real crossover point this isn't it? Is it a dental problem? Is it an emotional problem? Is it a physical therapy problem? You just go to your GP and look for painkillers. This question is, "Does the TMJ help pump the Eustachian canal and if so, do you see many people presenting with glue ear along with the TMJ problem?"

AT: I've heard people say that. I don't know and if you get into the cranial approach to things then the TMJ is very important, so for pumping that cerebrospinal fluid up and down the body. And interestingly, I'm aware of this now, one of the first things… the first thing I do in the morning is yawn and people do and why are they yawning? And they say that's the crank handle of the pump. So, you know, I don't know but…I mean to me, I think that the more you can get the fluids moving around, whether it be CSF or —

APM: Basically get the function getting going.

AT: It's great. It's all about function, isn't it? Yeah.

APM: Silva Schuldt, thank you very much for your comment here. She has pointed out that Horacio has a horrible overbite problem. But you've said overbite doesn't matter. So —

AT: Exactly. It's not structural, it's functional.

APM: So we don't need treat him.

AT: When you've got muscles like this then you don't have to worry too much. They twang, don't they?

APM: So thanks for that Silva and I will address his problems later on if he has any pain.

AT: I'd give it a brace.

APM: Is there any relationship between tongue-tie, untreated tongue-tie and TMJ dysfunction or facial pain?

AT: I don't know what's the answer to that. I have worked a little bit with speech therapists in the past and in my clinical practice, I couldn't be…I wouldn't know for sure. We do know that the way in which the teeth develop and the position in the jaw is related to muscle function. So if they've got a strong tongue thrust, the teeth are going to move into a particular way or if they've got weak lips, for instance, then those muscles are having an effect on the tooth position and they will have effect on the development of the face as well. We do know that but again, you know, there's great function in people with bites that are all over the place. If you look at the sports people, you know, they all haven't got some perfect bite. They've got the bite that works for them basically.

APM: Who'd have thought about strengthening the lip muscles?

AT: There's some work that's being done on that, you know. I don't have a speech therapist that I work with right now but I did back in the '80s and '90s and, you know, they'd be doing stuff for the lips and the tongue and all that sort of stuff, quite exciting but again, it's outside of my clinical practice. So I can't comment on that.

APM: Someone has asked in regard to strengthening exercise whether you've heard of or used the, I'm going to pronounce this wrongly, Rocabado exercise?

AT: Oh, Rocabado, yeah, I've heard of those, yeah.

APM: Are they effective?

AT: That will be the sort of approach that I would use a lot isometric and it's about retraining, you know…about the proprioception you were talking about. So whether you've got an orthotic in there or splint but also then getting them to look at the way in which they open and close. The other thing that people might find interesting, if they've got a patient with a painful click then it's natural for the patient to avoid that joint when they're eating but actually, it's counterintuitive but what you want them to do is actually eat on that side because when they eat on this side to avoid this joint, this joint does all the work by shifting over so they can eat on the right-hand side. So you want them to eat on the affected side and that would be somebody who's in acute pain, for instance. So that's another form of exercise, if you like.

APM: In doing that, will they find it less painful —?

AT: Yeah.

APM: And in which case, something's going to switch off on that side so that the joint can realign, the disc can —

AT: Well, it's really, actually, just resting the joint, you know. If it's a really hot joint, you know, you don't want them to chew anything too hard and if it's really bad on one side, if you are going to…when you chew, chew on that side, not what you think you should do which is avoiding it.

APM: Which purely coincidentally leads into a question which came in earlier on, quite some time back which is, "Don't all patients favor one side for chewing?" just like we have a dominant side for everything, "And if that's the case then could that cause TMJ problems and how do you reeducate them?"

AT: No, I don't think it does because we're getting into…I wonder if this is the opportunity to show the dentures —

APM: I think so. I'd hate you not to.

AT: There we go. Well, I've got the video specially. So let me show you how they make dentures, basically. If we can show this slide now, there's these two curves here called the curve of Spee and the curve of Wilson and you'll notice that they are symmetrical, left to right and front to back and the radius of that curve is, guess what—

APM: Four inches.

AT: --four inches, all on Bonwill's big idea. So if you had a patient with no teeth, basically, they're going to set the teeth up on a denture along those two curves of Spee and Wilson. So they're giving…because you've got a patient with no teeth, you can basically give them any bite you like. So why don't we

give them the ideal, which is the curve of Spee and Wilson, OK? And this is what happens when you give a patient that sort of bite. So what you're going to see here now is a patient with full dentures, none of their own teeth and they will…we've asked them to go into function and you will see how those…hopefully, how those dentures move and they're moving because the bite assumes that those two jaw joints move in a symmetrical way, OK? According to the curves of Spee and Wilson but of course, we know from our studies and you know from your own observation of people that people aren't symmetrical. The two curves of function are different and so in this case —

APM: What we saw there, we saw the dentures moving on the gum and the dentures moving against each other as well.

AT: That's right. So this patient is riding up and down on those dentures and when they ride up and down those dentures, the dentures move.

APM: What's that patient being asked to do, just grind their teeth or —

AT: Just grind and slide from side to side, OK? So I mean I was embarrassed when I saw this because I've been making dentures for 20 odd years, doing just that and the patients never complained because as far as…all the patients in the country are concerned, that is how dentures are. They're a false limb and it's like a false leg that's put on with a little bit of Sellotape. You better not do too much with it; otherwise, it's going to drop off. However, we developed, according to our theory, dentures which are…where the biting surfaces, the functional surfaces are customized to the patient's own functional movements and we know that they're asymmetrical and it's a non-linear curve and this is the same patient asked to do the same thing with dentures she's had in literally for two minutes and I think you can see there that the dentures hardly move at all and actually, her movements are much, much greater than she had before as well. So if that's…I use that as an explanation of what happens when you get harmony between the functional surface of the jaw joint and the functional surfaces of the teeth and if it's out of harmony, when the patient has full dentures, the dentures move. If the patient has their own teeth…and nowadays, you may have teeth fixed in with implants, then if it's out of harmony, something's going to break somewhere else and it's often the jaw joint or the muscles that start to complain or maybe the teeth will break or maybe the teeth will work loose but it's not so immediately obvious as it is when you have a full denture patient. So that's a very graphic and I would say an analog version of what we've also described digitally which is through the non-linear maths and that's one of the pieces of evidence that makes me think this explains more things than the old theory did.

APM: Would we be in the business of addressing the patient's dentures ourselves if they came in, saying, "Well, I've got this horrible facial pain around here,"

and we think, “Well, it sounds to me as though it’s coming from the TM joint”? Would we be in the business of saying, “Well, it’s possibly your dentures. You may need to go and see someone and get them fitted differently,” or —

AT: Yes.

APM: And then we’ve got to find someone who does —

AT: That’s tricky. I mean, well these types of dentures…and we are training a lot of the clinical dental technicians in this, actually. So they do exist. One of the things…so you may have a patient with problems with dentures but the interesting thing is…and one of the reasons that this model came up was if you look at dentures that are, say, five years old, the patient’s chewing brilliantly with them and you look at them and those—

APM: The curves have changed.

AT: --symmetrical curves are gone and they’ve worn them in to the asymmetrical curves. So it was one of the…that was a happy bit of serendipity because my denture technician came to me one day and said, “When I get these bent dentures fitting really well, it’s asymmetric, is that right?” And I’ve introduced him to Ron Presswood and all his stuff and said, “Well, look, this is what we find on people with teeth.” So it’s not that likely you’re going to get a denture patient with all of these problems unless they’ve really gone to pot, you know. They’ve had dentures for years and years. So it’s usually patients with their own teeth that have the problem.

APM: This question is, again, about addressing underbites and we talk quite a bit about that in the beginning. The question is how would you manage an underbite in an adolescent and can you influence the outcome after adolescence?

AT: If by underbite, we’re thinking that the lower jaw is set way behind the upper jaw so the upper teeth either look very far forward or the lower teeth look too far back, there’s theory among orthodontists that you can influence the shape of the jaw joint and the growth of the joint in a significant way if you provide some sort of orthodontics that’s going to train that lower jaw to come forward and be further forward.

APM: Growing bone should respond to stress, should they?

AT: They should but actually, when they really, really look at it, they’re struggling to find the hard evidence that that’s the case. What we do know, particularly in boys, is that lower jaw will tend to grow forward through their adolescence and late adolescence anyway. So is this orthodontics just going with the flow, if you like, rather than creating the flow.

APM: You said boys.

AT: Well, boys are a bit later than girls. Girls will start that mandibular growth, you know, on average, probably around about 11 or 12. Boys mature a bit later, so it'd be about 13 or 14 and then they can carry on growing a bit later on as well.

APM: So we shouldn't be surprised of an underbite in a young adolescent.

AT: No and if there's no aesthetic or functional issue then why treat it? Now, I would be concerned if the top teeth…if there's an underbite, sometimes it means the lower lip is too far back as well. If the top teeth were sticking over the lower lip then you've got this strong muscle here, which is going to tend to make those teeth flare. So that might be bad in terms of their appearance over time. So it'd be good to get those top teeth in behind…on or behind the lower lip but in terms…if they're functioning well then…see, I've seen patients with bites that seem all over the place but you put fingers on their muscles, get them to clench and grind around a little bit and it's working. So I'm not so worried about —

APM: And they're not in pain.

AT: No. So why do I do anything about it?

APM: I guess there is a lot of emphasis these days on appearance, as we said earlier on, on aesthetics.

AT: There is, yeah.

APM: I'm not sure. I think you answered this earlier on. When a TMJ clicks, what is clicking and you said it was that fibrous disc as it moves across the joint surface.

AT: So it's the condyle coming on or off that disc, either fully or part.

APM: Sorry, the other way round to what I've said of course. And somebody's asked what the name of those exercises were which was Rocabado exercise.

AT: Rocabado, yeah.

APM: Obviously, this will be in the transcript after we've put that up on the website and it will be in the final briefing and what's more, we will try to look up some internet references that we can put a decent guide to those exercises on the website as well to save you some effort but Rocabado is the name of the exercise —

AT: I think NHS Choices has a good one as well.

APM: Hast it? Ok

AT: And that's all the same sort of stuff, to be honest, yeah.

APM: Good. Have you got any experience with tinnitus in TMJ?

AT: Yeah, well —

APM: Any connection?

AT: I've had patients coming to me, asking me to treat their tinnitus and there's no direct connection. Some patients report that it feels a bit better but, you know, I explain to them…I first of all see if they've got any issue with their bite and if there's nothing wrong I can detect with their bite in terms of their function of the joint and the muscles then I can't really help them but there is something then I say, "Well, we can try this and see if it makes a difference," and some people say it is better and other people don't. So, you know, tinnitus I think is one of those things where it's partly your perception as well as whatever physically is causing it. So I try to under promise, over deliver on that.

APM: I think there's a sort of challenge amongst the people who watch this. They try to send in as many long words as they can knowing that I can't spend too much time dwelling on my little screen here to read these questions out but this one is…thank you very much for this, whoever sent it. Could I ask about the relationship between amalgam fillings and idiopathic neurodegenerative type symptoms? Actually, that wasn't —

AT: That's pretty good, well done. You kept your teeth in. OK, so, well, I was into amalgam replacements —

APM: So that's neuropathic idiodegenerative symptoms.

AT: Yes, so…and I presume we're talking about things like MS and stuff like that and there's no connection. No provable connection. One thing to be aware of is if the patient has their amalgam fillings replaced, the most dangerous time for that patient is when they're being replaced in terms of vapor generation and how they're replaced is really, really significant.

APM: Can it be done safely?

AT: Well, when I did a lot of that, I had patients who'd go off and have a blood test and say to me whatever we were doing didn't appear to be putting more mercury in their blood. So probably yes. I think probably the danger's for the dentist and the dental nurse to be honest but if you have…you have

something called a rubber dam which is a little sheet of rubber that fits carefully around the tooth and seals it from the rest of the oral cavity. You have high volume suction and lots and lots of water to keep their temperature down because your whizzing this diamond burr around and you're polarizing this and creating this amalgam dust and vapor. So all that's going away and then the other…so the other reason I'd see patients, where they'd go to another practice and have their amalgams replaced but their dentists didn't spend enough time getting the bite comfortable at the end of it and of course, then they're getting bite problems or TMJ problems. So then I'd see them and we'd sort the bite out. So that's the other risk that you get but I think to be aware, in terms of…if it's about mercury vapor then the most dangerous time's when they're having the amalgams replaced.

APM: But no connection, as we said, with—

AT: No hard evidence on that. No.

APM: --MS or other problems of that sort that we're aware of. This is a really interesting question, is if we suspect that dentures or bite or splints may be contributing to a problem and that TMJ's the issue is not being addressed properly, how would you advice our viewers here to discuss that or to get to talk to their patients about how they discuss it with their dentists? Because I reckon the worst thing any patient can ever do to their…probably their dentist but certainly to their doctor and say, "My osteopath has said…"

AT: That's right, yeah.

APM: Because the immediate reaction is hackles up and what the hell do they know?

AT: That's right. I suppose if the osteopath's being able to ascertain that the bite is affecting the muscle function in some way…one of the ways they do it is put that little bit of gauze over their back teeth and get them to move their neck and head and see if it changes the movement and then they could then go to the dentist and say, "Well, my osteopath has felt my muscles and finds that when I…bite changes, the muscles change. Do you think there might be…there's something to do with my teeth that we could change?" But the osteopath really should be trying to help that patient find that dentist who's interested in occlusion, basically, who's done studies on… done a study on occlusion, to be honest.

APM: Is there a list? Are they part of a society or —

AT: Well, probably the biggest single site is the British Society of Occlusal Studies and, you know, they're not really using this model that I've described to you but as I said to you before, their approach is to do reversible treatment, is to tend to do the type of splint that frees up the patient. So I feel that they're

very safe. They've had generally a very good training on looking after the patients well and things like that. So there's a list of dentists there. Some of them are familiar with this work because I've been lecturing on and off in the last couple of years and, you know, I know they've become familiar with it and like any good clinician, actually, they sort of listen and they say, "OK, well, I'm going to try it back on my patients," which is the same I did with Ron Presswood, you know. I listened to him 2002. I didn't really believe him until about 2005 when I'd had a chance to really try it on my own patients and they're finding, actually, that when they start to see that it's the Earth going around the sun, not the sun going around the Earth then they start to see these other things all start to make sense. So some of them are coming back to me know with that sort of revelation but I think if you go to a dentist that's being trained according…with the BSOS then…we can get that website for you, they're going to be pretty safe I think.

APM: That answers one of the other questions I think which is about how we help our patients get the best care if we're worried about their facial pain or their dentures. So, you know, if there's more to say on that then perhaps we can do that afterwards. One question here is about thumb sucking which is…every parents worry with kids if it's going to affect the orientation of the teeth. How does long-term thumb sucking affect function of the jaw? And what can you do to undo any damage?

AT: Well, the face is pretty plastic in the early years of life. So I think basically, if you stop them before about the age of seven then normal muscle function comes back and the teeth will arrange themselves according to the way the muscles of their tongue and their lips as they come through…the adult teeth come through, they'll get orientated that way. In terms of their…if they were to do that on a long-term basis, because I'm more concerned about what happens at the back, I'm not too worried if the front teeth don't touch. So I've seen patients who only bite on the very back teeth, maybe two teeth each side that still seem to be fine. Now, if those teeth are being heavily filled, they're damaged already and they're the only teeth taking all of the pressure of the bite then you might become concerned about those teeth but very often, you know, they're not being filled. They'll wear a little bit and they seem to be OK.

APM: And it doesn't cause any problems with mastication?

AT: No, they seem to chew fine, yeah.

APM: Because you'd kind of expect that. I mean we're supposed to cut through with the front teeth, aren't we? Well, if they don't meet, how do you —

AT: They work out different ways of doing it. So they get the food to the back or they'll do this sort of movement and tear on the teeth. So they seem to work it out, yeah.

APM: I thought it might be useful, and we are near the end of today's program, to think about how a typical case might present itself to us and how that's going to work with you. So if someone comes to us and let's say they have got facial pain or headaches, we're immediately going to look at the cervical spine. We'll look at all sorts of other things as well and some people will also look at their cranial dynamics. Your clues to the fact that…the possibility that it might be jaw related? Would be —

AT: Yeah. So you take a good history and one part of their history if they'd had any dentistry in the last few years, you know. That's extractions, bridges or, you know, new fillings, crowns, that sort of stuff. Does your bite feel comfortable? And you see, one of my measures is, "Is the bite right? Well, does it feel comfortable?" because people will tell you if it's not right. It's an extremely sensitive area and, you know, that's often ignored by the dentist but, you know, this isn't right but thankfully, things sort themselves out over three months. So usually, the problem goes away but if it's persistently uncomfortable, that would tell you something. And then I would get them to, you know, gently assess that they probably do already, the major muscles of mastication and then perhaps try that little test with, you know, their own EMG study and see if it makes a difference to the muscle function and their cervical spine function.

APM: And just to remind you that EMG study is fingers. It's not —

AT: That's right, yeah. You can buy the thing if you want to but, you know, you can't…especially you guys with the fantastic perception you have with your fingers, you can use it yourself and it's much…I think it's more human and you can get the patient to feel that as well. And then also work out, "Well, is there an actual joint dysfunction here?" So do they only rotate? Is there translation as well? Is it even? Are there clicks? And is there pain on chewing, you know? Those sorts of things will tell you this is a joint problem. If it's more vague, sort of symptoms of facial pain, for instance, they're waking up with headaches, say, but the joints seem to work OK, that would make you think it's more likely a muscle problem. And is it coming from the down up or is there something going on here? And that would come out in the history.

APM: I think you said earlier on you're not an expert in electrotherapy but you're aware of the role of electrotherapy in treating —

AT: Well, I think it's one of those things that disrupts those trigger points, does it? Maybe and also, maybe disrupts the pain perception as well and then we start to switch off the amplifier —

APM: I think there's some evidence, isn't there, for TENS in treating TMJ pain. The paper I read suggested there was some evidence, I'm not sure of the quality, for interferential but one of our other speakers, Tim Watson who I think is

certainly a national authority on electrotherapy had said that interferential does nothing at all. Ultrasound? Do you know —?

AT: I don't know anybody's used ultrasound. So I can't tell you that.

APM: I've had patients come in and asked for ultrasound in the past.

AT: I mean I've had it done on myself. I'm not aware of people using it for —

APM: On your TMJ?

AT: No, on a hamstring. So I know what it feels like. It's great but I'm not aware of anybody using that on the facial muscles in my experience. One of my patients is a chiropractor; he's using a cold laser. He seems to be thinking it's solving all sorts of problems but I don't know what the mechanism of that is. So I've heard about it.

APM: No. I mean we have interviewed Tim Watson on this subject and he's talked about laser therapy. So we have a broadcast in our recording library about ultrasound. I think we've got three about ultrasound and other electrical modalities. Well worth having a look at those and obviously, they've all got their own role, some of them have anyway. What other aspects of facial pain do you cover? I mean we talked briefly about trigeminal neuralgia earlier on. Is that something that you deal with or —

AT: Well, I've seen patients who have been described and diagnosed with trigeminal neuralgia and often, I don't think they have. There's very few that I found where, you know, it's truly triggered by some light touch. It's absolutely debilitating, painful, whatever it is, 20; 30 seconds and then you have a period, refractory period where they don't feel it again. If you get to know the patient a bit, you'll realize that actually, they are jumping at any touch. It's not just one trigger point, trigger area, if you like and, you know, you can see reasons why the muscles aren't functioning well and, you know, get them onside and say, "Well, should we try modifying the way these muscles work?" You'll switch off a lot of that sensory input to the brain. It'll quiet the whole thing down because we know that, you know, all those nerves and the trigeminal nerves, they're all so close together, you know. One can fire another one off. And so the brain perceives it's coming from one place and actually, it's from somewhere else. I've certainly have that with dental related pain. So, you know, I help the patient understand, "Well, just because it seems very clear in the way you're perceiving it doesn't mean to say it's exactly coming from there. So let's just quiet the whole thing down and, you know, turn off those sensory input, get the muscles working a little bit better," I'm calming them down and stuff like that and see what happens basically and you'll find a lot of them do improve. Now, some of these patients I've seen…I can think of one case who is a dental student who, you know, got pain from a tooth up here. She had fillings done all the way down

that quadrant. They didn't fix it. She then had root canals done all down that quadrant. They didn't fix it. In the end, she had the tooth out. OK, that still didn't fix it and eventually, she came to see me and she had a cervical spine problem and if you really listen to her history, she was running drunk through a garden one day at night and got, you know, decapitated almost by the washing line and it all started from there. So you can see how that's referred pain. She was sure it was toothache. All of these experts in the dental school was sure it was toothache but it wasn't toothache. It was a problem from the trapezius and cervical spine and, you know, it —

APM: Possibly, the same thing works the other way because we all see what we're looking for, don't we?

AT: That's the point.

APM: To some extent —

AT: Absolutely, yeah and if your own, you know…if your only tool is a hammer, every problem is a nail, isn't it? So yeah.

APM: Andy, this has been a great talk. It's been one of these wonderful —

AT: Thank you.

APM: Really, it's been one of those wonderful occasions where we stand as a link, not just our own therapy but someone else's therapy into, you know, the whole structure and function of the body and I'm sure that most people out there will be delighted that you've got this structure and function approach to dealing with pain.

AT: Thank you, yeah.

APM: Because that's what we think we're all about. So on behalf of all them but from my point of view, particularly, thank you so much for coming in.

AT: Thank you, Steven, thank you.

APM: And I've been asked whether your clavicle's hurting with all these waving around you're doing.

AT: No, I'm OK if I keep it down here.

APM: I'm conscious if I shake your hand not to wave it around.

AT: Thank you.

APM: But thanks again for coming down to see us.

AT: I've really enjoyed it.

APM: It's been great.