

Howard Farran: Good morning. This is going to be a very fun and exciting interview. I get the honor and privilege to talk to Dr. Joseph Choukroun, who is a medical doctor from France, who for 30 years has ran a pain clinic in _____, France and this is all because of my very good friend, Dr. Ken Serota, who is an endodontist in Toronto, Canada. And of all of the dentists I have ever met, I have never met anyone who knows more people around the world than Ken Serota. And Ken, he always knows the most elite doctors that apply to dentistry, whether they be MDs, endodontists, specialists, what have you. But if you are in Ken Serota's rolodex, you are the cream of the crop of the smartest minds in healthcare. So Joseph, it is 9:20 in the morning here in Phoenix, Arizona. And I just ran half an Ironman, or half a marathon. I ran 13.1 miles. What time is in in France?

Joseph Choukroun: It is 6:25.

Howard Farran: PM?

Joseph Choukroun: PM, yeah.

Howard Farran: Okay, so it is morning here and evening there. So I don't even want to interrupt you. Why don't you introduce yourself to the American dentists and tell us what you know about pain and anesthesia from 30 years of experience.

Joseph Choukroun: Yes, thank you, Howard. It is my pleasure today to present my experience and my view, my point of view on the anesthesia and the pain treatments in oral surgery, because usually the patient often is dreaded by the pain. This is the first question that they have, what about the pain about the treatment or the surgery.

Howard Farran: Fantastic.

Joseph Choukroun: Okay, I am ready to start. Usually in the dental office, we have several questions about pain, because the patient often dreaded by the patient. But if we understand as well the physiology of the pain and the side effects, we can manage this pain and we can prevent this pain. First, what is the definition from the International Association for the Study of Pain is an unpleasing sensation of variable intensity. This is the only one definition that we could do, because we have not the possibility to define the pain differently. By the way, we have first to understand a little bit. I don't want to make a big course on pain, but we have to understand some rules of the pain. First, why the mouth is so sensitive, because the patient before coming to the dental office, they know that they will have pain. We have some patients that never went to the dental office, but they are afraid about this pain. We have a physiologic explanation, but we have also to ask about the definition of the threshold of pain. First, we have in our body pain receptors. All of the body, all of the body, all of the surface of the body contains a lot of pain receptors. The name is noci receptors, because the scientific definition of the pain is the nociception. Those receptors are really diffuse in the body. But we have a specificity in the oral cavity. This cavity contains the majority of the pain receptors. We have two places in our body who contains the majority of the pain receptors, is the mouth and the hands. This is why when I go, when I meet a dentist, I am sure that he will give me pain if he touches my mouth, because we have a very high concentration of the receptors of pain. But we have also to understand what is the threshold

of pain. The threshold is the sensation level at which pain appears. What does it mean? It means that I touch you, you have all these sensations. I press again and again, and then at the moment, you will feel pain. This is the threshold of pain. And each individual has a specific level of this threshold. What does it mean? It means that we meet some patients, we touch them, and they feel pain immediately. It seems that they have a very low level of this threshold. But we have also patients, we do some treatments, they don't feel pain, because they have a high level of the threshold. This is the difference between all of the people in the dental office. Everyone has a specific level, but we have a chance in the biology that this level should be modified by certain substances. For example, when we excise a patient, when we give him _____, immediately the level is going down and then the pain occurs rarely. If we give to the patient sedative or morphine, it seems that this frequently will increase the threshold level and then the pain appears later. This is why in the dental office we are using often sedation. The sedation in use always the pain to relief only by increasing the threshold of pain perception. When we do sedation, immediately the patient feels less pain. This is the analgesic mechanism. What kind of sedative we can give to the patient? We can give a lot of sedative, we have benzodiazepines, we have other multiple models for sedation. But it is one model that I prefer to use is the hydroxyzine. Hydroxyzine is a sedation, the name is Atarax. With hydroxyzine, we can obtain analgesics, mild relaxation, it is addressing for opening of the mouth. We decrease the neurovegetative reactions. But one of the most important interests of the Atarax is that this _____ gives to the patient an anti-allergic action. What does it mean? First, we have to understand what is the immediate allergy. Immediate allergy is when we are in contact with a product or molecule, immediately the macrophages in our body start to release high concentration of histamine. And this will induce vaso irritation and then low blood pressure and maybe shock and bronchoconstriction and then atopic asthma crisis. If we want to block the allergen, we need to block the histamine release. And how to block the histamine release is an antihistaminic problem. And the best culprit is the hydroxyzine. With the hydroxyzine, we block the histamine release and then the patient cannot do any allergic reaction. How to block this allergen? We can prescribe _____ of hydroxyzine, 25 milligrams, one tablet of 25 milligrams each day during three days preceding the surgery. It seems like we give one tablet a day, minus one day, minus two, and day minus three preceding the surgery. And usually the patient takes this tablet in the evening before the bedtime. And then if we give this medication, this protocol to the patient, we have a full protection against acute allergia. You have not 99% of prevention, you have 100% of prevention of the allergic reaction. If the patient comes to the office and tells you, "Hey Doctor, I am allergic to latex." What can we do? Yes, usually we say we can change the gloves to use the plastic gloves. But you are not sure that you have not latex on the walls, on the ground, etc. If you want to protect your operation, you must give to this patient hydroxyzine before coming to the office. Also, if the patient is allergic to anesthesia, well then if you give him this medication, you can inject the anesthetics and he will never do any allergic reaction. Why? Because the macrophages are blocked totally and definitely for a long time. This is why I prefer to use this kind of sedative as hydroxyzine. About pain, we can discuss about two periods. We have the treatment of pain in the periop of timing and we can manage also the postop pain. And the management of the two pain is not the same. In the perioperative period, the goal is to have surgery without pain, but also without stress. This is why we have to give sedative to the patient. It doesn't matter what kind of sedative, but we have to make sedation. If we want to make a surgery without pain first, we use every day local anesthetics. But what are the best conditions for the local anesthesia? Let's

go to understand the mechanism of the anesthesia. Anesthetics are amino amides. And in the pharmacology, when we want to analyze the time of action of a product, we usually check the half-life of immunization. For example, the little _____ the half-life is one hour, thirty minutes. The _____ the half-life of immunization is around two hours. But if we compare the pharmacological properties to the clinical experience, we know that it is difficult to get every time an anesthesia with more than two hours. What is the problem when we use the anesthetics? This is a cell. The property of a cell is it contains potassium inside. And when we do simulation of the cell, immediately the potassium is going outside and then the sodium goes into the cell with water. This is the reaction after a stimulation of a cell. When we use a local anesthetic, we have the cell and immediately after the injection, it doesn't matter if the cell is neural or muscle or keratinocytes, all of the cells that are in contact with the anesthetics, immediately the anesthesia blocks the sodium channels of the cells. And then when the sodium are blocked, the sodium cannot go inside the cell. And if the sodium movements are not possible, the potassium movements are also blocked. And then we block all the ionic movements through the membrane. And then we have no depolarization and with no depolarization, we have no electric currents. And then we have no sensation. This is how we obtain the anesthesia. This is the vial of the anesthetics and we have inside a liquid. This liquid is a water soluble salts. What is a water soluble salt? It is an acid. For example, the pH of the _____ is 3.4, very acid. And then we understand immediately why the injection creates pain. The pain of the injection is coming from the acidity of the product only. And then if we inject quickly, will we create more pain because we inject more acid? It is already the reaction of the tissue when we inject an acid product. Then if we go further, we can analyze the physical chemical properties. When we use an acid, every time this acid contains two components. One is _____. The _____ form is around 97% of the vial. Why we have a lot of _____ that form because the product is acid. And we have three percent of non-_____, but the problem is that the action of the product is coming from the non-_____ product. We get anesthesia in the beginning only with three percent of the vial. This is how we start the anesthesia. When we inject, we inject an acid. But the gingiva, the pH of the gingiva is at 7.4 and when we inject, immediately the gingiva starts to increase the pH of the solution. This is the balance. And then if we increase the pH, we increase the non-_____ solution. And if we increase the non-_____ solution, we increase the anesthesia level. This is the behavior of the anesthetics when we inject them in the gingiva for example. But sometimes, we have an acidity in the middle. And if we have acidity, the composition by the gingiva will be less. When we inject in acid gingiva, we don't have full implementation of the pH and then the non-_____ solution increases slightly and then the anesthesia level increases slightly. The poor level of anesthesia is when we have an acidity. When we have a pH low, then we have a low quantity of non-_____ and then the anesthesia is poor. We can explain today why we have some failures in anesthesia, because if we have acidity, we will have a poor anesthesia. We understand why when we have an infection, when we do a lot of extraction, we have a poor anesthesia, because we have acidity. And then when you inject your anesthetics and you do not obtain a good level, don't try to inject more and more anesthesia. It is not a problem of the quantity of anesthetics, it is a problem of acidosis. What can we propose? Yes, if we understand that the pH is the key, we can increase the pH. How to increase? If we inject an alkaline solution, because if we increase the pH, we will increase the efficiency. We have a product that is available in the pharmacy, it is the sodium bicarbonate. Isotonic sodium bicarbonate. The pH of the sodium bicarbonate is 10. What is the sodium bicarbonate solution? It is a saline solution with

bicarbonate. It is isotonic, it is the same _____ the same that the signed solution. But when we inject, we will immediately increase the pH of the gingiva and then we will increase the availability of the non-_____ solution of the anesthetics. And then if we inject this alkaline solution, we will increase the level of anesthesia. What quantity? It is very simple. If you inject 2 cc of anesthetics, you inject 2 cc of sodium bicarbonate and you will see every time when you have a poor level of anesthesia, when you inject the alkaline solution, in a few minutes you have full anesthesia, completed only by modifying the pH of the medium. We have another question about the toxicity of the local anesthetics. The toxicity of this product is first neural toxicity, but also hard toxicity. But this toxicity is coming from the move of the product in the blood, in the circulation. How to get toxicity, how to get the movement of the solution in the blood, only by pressure. And this is why today in the literature, we can explain that we never had any toxicity if we inject slowly. When we inject slowly, we inject with low pressure and then we have not the product going into the blood circulation. We have never toxicity if you inject slowly. Another topic is how can we increase the time of action of the anesthesia? We understand that if we increase the pH, we will increase the time of anesthesia. But usually we use also vasoconstrictors to increase the time of anesthesia. But there is a physiology question. When we inject, the adrenaline with the _____ or with the _____, what is the time that we need to wait to get the full adrenaline attained? Usually the dentist, they inject and they _____ the viscera, make an incision. Biologically, physiologically, we have to wait ten minutes, because we never had in the body a product that is able to make the full activity in a few seconds. We need time to get the full adrenaline activity. And for me today, the minimum is 10 to 15 minutes before incision. But the question is, how can we apply this rule? Because I am doing lectures since more than 20 years all over the world. I never met one dentist who is able to wait 15 minutes. When a dentist has a viscera in their hand, it becomes crazy. And then how to stop the dentist? How to wait? Simply by changing the procedures. We have to inject and then we can prepare the table, the patient, etc., waiting naturally ten minutes at least. But it depends also on the type of anesthesia that we want to use. If you are doing a small surgery, you don't need two hours of anesthesia. You can do the incision immediately, but you will see that you have bleeding immediately. If you wait, for example, if you have a big surgery, you need to wait, because when you do your incision, you have no bleeding. You have full activity of the adrenaline if you can wait 10 to 15 minutes. Another addressing information is in the mandible we can do local regional anesthesia. But we forget often that we can do also local regional anesthesia in the maxilla by injection around the infraorbital foramen the anesthesia. How can we do? It is very easy to palp the foramen in the _____ cheek. And then we place our finger in the place of the foramen and we go in the gingiva and we go with the needle to this area and then we will inject and you will increase the quality of the anesthesia when you have a big surgery. I started to explain the mechanism of action, that the anesthetics, they block the sodium channels. It seems that they block all of the cells in the tissue. When we do surgery, we have a big aggression on the tissue, with the viscera, with the tweezers, with the _____, we induce a lot of aggression. And then the reaction of the tissue will create inflammation. We know that when we want to be in rest, immediately if we go on the rest, immediately we start to heal quickly. This is the concept of the protection of the tissue by the local anesthetics. When we inject the local anesthetics, we block the cells and then the cells, they do not react to the viscera, to the incision, etc. This concept of protection of the tissue, we use it in the posttraumatic neural protection. What we do when we have a trauma on the head with some neurologic symptoms, we start to put the patient on full sedation and

full general anesthesia. Why? Because we want to block all of the brain about inflammation and bad reaction after the trauma. We have the same position today in the pain clinics that we can block all the tissue when we do surgery. And then the rules are very simple. We must when we do general anesthesia, we must do local anesthesia. The general anesthesia is given for the patient, the anesthesia, but the general anesthesia does not protect the tissue. When we do general anesthesia, we have to inject in the tissue the local anesthesia. And this is why sometimes when we send the patient to a surgeon and they have a lot of swelling because they do not local anesthesia. When we do local or general anesthesia, we have to add local anesthesia, because local anesthesia will protect the tissue from the aggression of the surgery. And then we can ask the question, because we need to have in our mind that all of the time the anesthesia has to be of maximum duration. Because as the block is a long time, as the tissue will be on protection. And then I have the question, is there an interest to add more anesthesia at the end of the surgery? Usually when we finish the surgery, we don't think that we have to continue the protection of the tissue. My experience in 20 years now is when I finish my surgery, I inject again a little dose of anesthetics. I don't need to make full anesthesia, because the surgery is finished already. I need to continue the protection of the tissue. And this is why for example we prefer to inject bupivacaine. Bupivacaine is a good anesthesia for sensitive and it is the best product for a long-term anesthesia and analgesia. Then if we inject a few drops, we don't need to inject a lot of product. A few drops. For example, for a full maxilla, my advice is to inject one vial. It is sufficient. But we will have several hours of analgesia and several hours of protection of the tissue. And the surprise is after this analgesia, the patient, they don't feel too much pain. Usually, when we finish the surgery, they start often to feel pain. Then they will come back home without pain, they will stay a long time without any pain and without any drugs. Yes, we have to inject every time when we finish the surgery, a small dose of anesthetics. In the postop, the situation is different. We use the anesthetics, we have a long time of postop, a long time since a few hours. But what can we do for our patient to obtain the pain relief? We can use analgesics, but the most important is to avoid inflammation, because the pain is coming from the inflammation. But also, we have sometimes to treat and to make some sedative to the patient because they are under stress. What kind of pain cures can we use? Perhaps the most common, ibuprofen is common. But my first advice is that we have to avoid this molecule. Tramadol is a very nice analgesic, but it is not a treatment for acute pain. Tramadol, I use it in chronic pain, not in acute. Why we need to avoid the tramadol? Because it has a lot of side effects. We need to give to the patient a safe treatment. Yes, tramadol is very powerful, but the patient will have a lot of side effects. We don't want to go in this way. We want only to avoid the pain. But I tell you that the pain comes from inflammation, and then what kind of anti-inflammatories can we use, steroid or non-steroid? Non-steroid, like ibuprofen, etc. are not anti-inflammatories. They are only analgesics. Because the inflammation is post-surgery inflammation and those molecules are not active on postop inflammation. If we want to block the inflammation in postop, we have to use steroids. It is the only one effective anti-inflammatory drug in the postop pain world. What is the pharmacology of the cortisone? Usually we are talking in the pharmacology about half-life of elimination. The half-life of elimination of the cortisone is around four to five hours. It is too short. But we have to go further. The half-life, the biologic half-life, is around 50 hours. It seems that when we use cortisone, we have around three days of action. We don't need to give to the patient three times a day for three days. We have only to give to the patient one dose, because when we give to the patient one dose, one efficient dose, we will have

anti-inflammation for three days. This is the pharmacology of the cortisone. And then we have to start before the surgery. We have to block the inflammation before the surgery. It seems that we can give them one hour preop. We have to give them one dose, enough for three days, but we have to get the effective pathology. What is the effective pathology? It is one milligram kilo of prednisolone, at least, one to 1.5 milligram kilo. It depends on the surgery. We can use dexamethasone. The pathology of the dexamethasone is 0.25 milligram kilo. We give them this pathology just before the surgery and then your patient will be quiet for three days. If you do a big surgery or you have a big inflammation, you can repeat this pathology in three days. And then with a low dose of cortisone, you will have a very good pain relief. But we have sometimes questions about the cortisone. What is the action on the bone metabolism? Because sometimes we have some information about the bone and the cortisone. We know that the cortisone blocks the bone metabolism, but we are using one single shot. And then when we use one single shot, we have no side effects. We have only benefits of the cortisone. When we use one shot, one shot, one pathology, not intravenous, usually my advice is to give orally. We don't need to inject. If you have a catheter, if you can inject, you can do it. But we can use the simple pathology by oral. Because when we use the cortisone, and for me today, my advice is to use every time the cortisone in all of the treatments, in all of the surgeries, because we know that we will have always a good effectiveness. The analgesia will be perfect. The patient, they don't need to take any tablet or any pain killer, because they have no inflammation. With no inflammation, they will not have any pain. The swelling will be very low. But we never forget that the cortisone is an excitant. There will be euphoric and maybe they will lose a little bit of sleeping. But it doesn't matter if they don't sleep. They do not have any pain. And also we have to understand that using cortisone is the best treatment to block the foreign body reaction. In the surgery, when we do surgery we use titanium, we use biomaterials, we use a lot of product. Those products, all of them, they induce a foreign body reaction immediately. But we have today the evidence that we have a negative correlation for atherogenesis and the atherogenesis is the first condition to get the hitting. We have a negative correlation for atherogenesis with inflammation around the foreign body structures. And then if we can simulate early and temporary, the glucocorticoid receptors, if we give to the patient cortisone, we will block the foreign body reaction, but we will have a beneficial effect in the long term. Not only we will have in the short term, we will have lower inflammation, no pain, but we will have long-term beneficial on the foreign body reactions against the product that we put below the gingiva. This is what I wanted to tell you about, how to manage simply the pain, how to understand, how we can manage first the pain during the surgery and secondly in the postop period. I want to show you some pictures. This is a patient with sedation and treated with this protocol, we did a full implantation in the mandible and two sinus lifts. And you see that the inflammation after one day is very low. Why? Because we blocked the inflammation before the surgery. This is two kind of surgeries, one is a full arch implantation after one day, we have not too much inflammation. On the right, we have a patient with a sinus lift after one day. We have not too much inflammation, because we block the inflammation before the surgery. I want to show you a case where we missed all of my rules. This is a lady who got the surgery with general anesthesia and they did two sinus lifts, only two sinus. But where is the problem? First they did the surgery under general anesthesia. They forgot to inject local anesthesia. And then the bleeding around the maxilla will go in the orbital area. The bleeding, when you have bleeding in the maxilla, the blood goes in the orbital region. She has a lot of swelling after five days, because they did not treat it. They did not treat the

inflammation before the surgery. I believe that my slides were clear and educational. I will be happy if you have some questions or any comments. Thank you for your attention.

Howard Farran: Well thank you very much, that was an outstanding presentation. And a bit shout out, thanks to Ken Serota and thank you for taking your time in _____, France to call me this morning. And I hope you have a fantastic day.

Joseph Choukroun: Yes, thank you. Thank you very much. It is always my pleasure, because I am not doing education for dentists. I want from the patient to avoid the pain.

Howard Farran: Absolutely.

Joseph Choukroun: That is my objective, but it is my pleasure to share my experience. Simply, we don't need to make complicated protocols. We need first to understand how is the pain and then it is simple to treat and simple to prevent. Because in the medicine, prevention is always the best. Thank you for your education. I hope to meet you soon in face in the future, because I am traveling often in the U.S. It would be my pleasure. Thank you very much.

Howard Farran: Thank you very much, doctor.

Joseph Choukroun: Thank you, goodbye.