

March 08, 2022

Dr. Anna Minnema



Dear Dr. Minnema,

We are writing in follow-up to your evaluation at the Piper Clinic on March 08, 2022. At that time, you were self-referred for our opinion about the management of your temporomandibular joints and malocclusion. Included with this letter, you will find a copy of your **Piper Clinic Chart Narrative**, which has been dictated by Mr. Jeffery Thompson, PA-C. This chart narrative contains the history and examination findings from your evaluation. Since this information is included, we will not detail it further, except to note that you were 37 years of age at the time of your consultation. You presented with a primary complaint of TMJ pain with bite changes and a decreased range of mandibular movement.

As you will recall, several diagnostic studies were generated and reviewed with you during your workup. We first evaluated a **Cone Beam CT Scan** of your skull, facial, and cervical structures. For your records, a copy of your fully-dictated **Piper Clinic CT Report** is included. Five areas were assessed in the C.T. scan, including your temporomandibular joint foundations, your dentition and occlusion, your dental and facial profiles, your sinuses and airway, and your upper cervical spine.

C.T. Diagnosis of the T.M.J. Foundation: Your temporomandibular joint structures were assessed for childhood injury to the growth centers, for acute or chronic degenerative arthritis, and for distortions that are encountered with soft tissue injuries to the ligaments and disks. The CT evaluation of your left temporomandibular joint showed an incredibly small, sclerotic arthritic condyle with loss of articular spacing. The right temporomandibular joint was found to have an even smaller condyle with similar findings.

C.T. Diagnosis of the Dentition and Bite: The dentition was examined to determine the general health of the teeth and the supporting periodontal bone. We noted that your teeth were in good repair. Wisdom teeth were not present. There was generalized mild loss of periodontal bone height. Additionally, the occlusion or bite was graded with a standard dental assessment of alignment, known as the **Angle Classification**. Angle Class I is a normal alignment in the relationship between the upper and lower teeth. Angle Class II is a receded projection of the lower teeth relative to the upper teeth, and Angle Class III is an over projection of the lower to upper teeth. Your bite alignment is Angle Class II.

C.T. Diagnosis of the Facial Profile: The upper and lower jaw structures were assessed for general growth and development and the projection in alignment relative to each other. The CT scan showed that your maxilla or upper jaw structure was hypoplastic in projection. The mandible or lower jaw structure showed evidence of significant retrognathia. As described above, the Angle Classification is also used to diagnose the projection of the profile, and your alignment between the upper and lower jaw structures is Angle Class II.

C.T. Diagnosis of the Airway and Sinuses: The nasal cavity and sinuses were imaged for abnormalities, which can be a source of facial pain or headaches. Your nasal septum deviates right. On the day of your examination, your sinuses were free from inflammatory changes. The pharyngeal airway is located posterior to the tongue, and in your C.T. evaluation, we were able to measure the smallest size of this airway. This dimension can be negatively impacted by the loss of projection of the maxilla or mandible. Most healthy pharyngeal airways show a minimal cross-sectional area of greater than 90 mm². Your pharyngeal airway measured 43 mm² of minimal axial dimension. Therefore, your pharyngeal airway dimension is significantly narrow.

C.T. Diagnosis of the Upper Cervical Spine: The upper four or five vertebrae of the cervical spine are visible in the Piper Clinic CT scans. Frequently, a malalignment of the first, second, or third cervical vertebrae may refer pain to the base of the skull, to the region around the ear, to the vertex or top of the head, and to the eyes or forehead. Therefore, the alignment of your upper two cervical vertebrae (C1 and C2) relative to your skull base was evaluated, and the C.T. scan showed malalignment. Within reasonable medical probability, you may have a significant risk of cervicogenic headaches.

We also reviewed **Magnetic Resonance (M.R.) Scans** of your temporomandibular joint foundations. Your MR scan was generated by **Diagnostic Imaging at Baywalk**. Our review focused specifically on the temporomandibular joint structures. Additionally, some images were generated within the brain, around the skull base structures, and through deep portions of the face and cervical spine. It is beyond the expertise of your Piper Clinic physicians to identify all of the potential abnormalities which may be present outside the temporomandibular joint region. That is why board-certified radiologists are an integral part of your diagnosis. The official interpretation of your magnetic resonance scan will be written in a report from the radiologists at Diagnostic Imaging at Baywalk. Therefore, it is imperative that you obtain and read the radiologist's report of your scans.

Within the temporomandibular joints, M.R. imaging is most useful for diagnosing ligament problems that result in herniation of the discs, inflammatory fluid changes in the joint spaces (effusion) or tissues (edema), and arthritis or circulation problems such as avascular necrosis (AVN) in the bone structures. Additionally, when combined with C.T. scans, M.R. scans can give insight into growth plate disturbances (osteochondral growth deficiency) in one or both mandibular condyles.

The **MR scan of your left temporomandibular joint** shows that the disc is herniated and perforated. The fluid content within the joint spaces is increased, and fluid is noted within the left condyle, indicating a subchondral cyst. There is evidence of arthritis, and

the marrow signal within the mandibular condyle is consistent with loss of normal marrow signal consistent with sclerotic bone or avascular necrosis. Based on the findings from the M.R. scan, the left mandibular condyle projects to be unstable in the future. This condyle is extremely small in size and shows evidence of active arthritic degeneration and, therefore, will likely lose even more bone with time.

There are abnormal findings in the **M.R. scan of the right temporomandibular joint**. The disc on the right side is also herniated, locked, and perforated. The assessment for fluid in the T2 or STIR scans is consistent with no obvious joint effusion. Arthritis is evident, and the bone marrow of the condyle shows similar findings to the opposite side in that there is sclerotic bone and loss of normal marrow signal. The prognosis for the right mandibular condyle projects to have long-term instability.

The combined findings from the C.T. scans and M.R. scans can be precisely Classified. The **Piper Classification of Temporomandibular Joint Disorders** is one of the most widely utilized systems for diagnosing T.M.J. abnormalities. The Piper Classification has five general stages of disc and ligament problems as follows:

Piper Stage I: Intact ligaments with normal discal alignment in all movements.

Piper Stage II: Mild lateral ligament laxity with intermittent disc slippage.

Piper Stage IIIa: Ligament laxity with the displacement of the lateral half of the disc. The condyle will slide or "click" beneath the disc with jaw protrusion or opening.

Piper Stage IIIb: Ligament laxity with locking of half of the disc at the lateral pole. The condyle will not slide beneath the disc, and clicking sounds disappear.

Piper Stage IVa: Ligament laxity with the displacement of the whole disc at both poles. The condyle will slide or "click" beneath the disc with jaw protrusion or opening.

Piper Stage IVb: Ligament laxity with locking of the whole disc at both poles. The condyle does not slide beneath the disc, and the disc remains locked in all movements.

Piper Stage Va: Herniated and chronically locked disc. Perforation of the retro-discal ligament tissues results in bone-to-bone contact, and the condyle projects to be unstable.

Piper Stage Vb: Herniated and chronically locked disc. Perforation of the retro-discal ligament tissues results in bone-to-bone contact, and the condyle bone is stable but more brittle than normal.

The Piper Classification of Temporomandibular Joint Disorders also includes various types of bony abnormalities:

Osteochondral Growth Deficiency (OCGD): Underdevelopment of the mandibular condyle secondary to disc displacement and damage to the condylar growth center. This condition relates to childhood injury with disruption of the growth plate.

Avascular Necrosis (AVN): Death of the bone marrow of the mandibular condyle secondary to locking of the disc or chronic contusion to the condylar surfaces.

Osteochondritis Dissecans (O.C.D.): Damage to the bone marrow immediately beneath the surface of the condyle from chronic overloading. This most frequently results from displacement of the disc or from chronic forward posturing of the mandible.

Osteoarthrosis (O.A.): Irregularity of the condyle or skull base resulting from disc displacement with subsequent development of surface arthritis.

Osteopenia/Osteoporosis (O.P.): Evidence of decreased bone density as a result of genetics, hormonal abnormalities, systemic illness, malnutrition, or usage of nicotine products.

Inflammatory Arthropathy (I.A.): Evidence of swelling in the joint spaces or soft tissues from damage to joint structures or as a result of systemic illness, such as rheumatoid arthritis, psoriatic arthritis, lupus, or Lyme disease.

You have the following diagnoses from the findings in your C.T. and M.R. scans:

Your Left Temporomandibular Joint:

Piper Stage Va

Bony abnormalities: Osteochondral growth deficiency, osteoarthrosis, avascular necrosis

Your Right Temporomandibular Joint:

Piper Stage Va

Bony abnormalities: Osteochondral growth deficiency, osteoarthrosis, avascular necrosis

Your next area of diagnostic evaluation was a thorough workup of your bite or occlusion. In some patients, malalignment of the bite is hereditary, or it might be caused by habits. Additionally, the alignment of the bite relates directly to the condition and position of the structures within the temporomandibular joints. This type of bite evaluation is known as **Joint Based Occlusion**. The initial research to define how the temporomandibular joints alter the bite was performed originally at the Piper Clinic in the mid-1980s. There are two general pathways into the damage of temporomandibular joint structures. The first is through microtrauma related to a pre-existing bite abnormality, which may strain and injure the temporomandibular joint foundations slowly and progressively. Fortunately, the resulting damage from microtrauma is more likely to be limited to Piper Stages II or III, and most often, these joints are not symptomatic or problematic. The other pathway into the damage of temporomandibular joint structures is through macro trauma, such as

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stretch injury to the jaw, contusion to the chin, or whiplash injury. Macro trauma is more likely to result in a Piper Stage IV or Stage V with a higher probability of osseous abnormalities.

When the bite alignment is abnormal due to abnormalities of temporomandibular joint structures, the resulting malalignment is called a **Joint Based Malocclusion**. Diagnostic bite records were obtained to determine whether your joint foundations have contributed to alteration in the alignment of the bite in the lower jaw structures. Bite impressions, scanned images of the teeth, and photographs of the face and occlusion (alignment of the teeth) were referenced. These were compared to the findings from your C.T. and M.R. scans, referencing various static and dynamic movements of the jaws. Your bite is abnormally aligned, and there is evidence that your temporomandibular joint foundation has altered the structure of your bite. Using the computer model as well as your own images was able to show you that the loss of joint dimension secondary to severe condylar bone loss as well as lack of normal growth has led to a skeletal Class II relationship. The common findings of a steep mandibular plane angle and anterior open bite are also noted.

Finally, your workup included a thorough evaluation of pain patterning in the head and neck. Your pain was assessed through several different methods:

- 1). You were given a questionnaire, which is called a "**T.M.J. Scale**." This test compares your signs and symptoms of jaw dysfunction to other patients who are known to have a temporomandibular joint disorder. Your answers were tallied into raw data, which can be converted into a percentile ranking relative to other "T.M.J." patients of the same gender. You scored at the 99+ percentile for pain emanating from the temporomandibular joint, at the 99+ percentile for limitation of jaw movement, and at the 76th percentile for pain from a non-TMJ source. From these values, we concluded that you had responses that match other individuals with a known temporomandibular joint abnormality. Your answers indicate that you have pain consistent with a secondary source of headache or facial pain. You had a 98th percentile score for stress. Therefore, your stress level is significant, and this could be a result of your pain, or it could be contributing to your overall pain level. . Finally, you scored at the 33rd percentile for psychological factors. A high score in this area may warrant additional counseling. Your score for psychological factors was not significant.
- 2). You were tested for **Complex Regional Pain Syndrome Type 1 (CRPS-1)** through your answers to a second pain questionnaire and from our examination. This syndrome may cause autonomic nervous system abnormalities in the head and neck, which can result in a mixture of pain patterning, swelling and sweating abnormalities, circulation problems with skin discoloration, joint movement disorders, or muscle dystonia (abnormal spasm) in the face and cervical regions. We concluded that you fulfill the diagnostic criteria for this CRPS-1.
- 3). We administered the third questionnaire to determine whether you have pain, which is interfering with daily activities. This **Fibromyalgia Pain Impact Questionnaire (F.I.Q.)**

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is used to determine how patients are coping with chronic and generalized pain conditions. It was not our goal to determine whether you have fibromyalgia, and separate testing would have to be completed to make this diagnosis. In the severity analysis, any F.I.Q. Score from 0 to 38 represents a mild impact effect, 39 to 58 is consistent with a moderate effect, and anything greater is a severe effect. Your ranking was at the 13th percentile. Therefore, it appears that your pain is having a mild impact on your daily routines.

4). We also utilize diagnostic nerve blocks when we are trying to distinguish between pain that is emanating from the neck versus the pain that comes out of the temporomandibular joints and facial region. Quite simply, by selectively blocking specific nerves, pain can be traced back to its origination. Pain from the temporomandibular joint travels through the **auriculotemporal nerve**, which is a branch of the trigeminal nerve in the face. This is the primary sensory pain source for the temporomandibular joint. This nerve is anesthetized in front of the ear. A second pathway for facial pain is through the nerves that originate in the upper cervical spine. This pain is tracked by blocking either the **greater occipital nerve** at the base of the skull or the **superficial cervical plexus** on the side of the neck. A third pathway for pain in the face is through the sympathetic nerves, which originate in the upper thoracic portion of the back and then travel as a chain through the cervical region to send smaller branches to the face. The sympathetic nerves travel with blood vessels or with other sensory nerve bundles. We block sympathetic nerve branches in the neck either in the **superficial cervical plexus** or through branches of this nerve network, such as the **greater auricular nerve** and the **transverse cervical nerve**. On the day of your examination, your pain patterning was significant. Therefore, I anesthetized the right auriculotemporal nerve, and you noted a near-complete resolution of your discomfort. As a result of this nerve blocking, we diagnosed that the more significant pain that you are having on the day of your evaluation was secondary to joint pathology.

In formulating all of the information from your history and examination and from your various diagnostic tests, we concluded that you have evidence of long-standing damage at the level of the temporomandibular joint, which has led to end-stage disease. The joint damage likely started in childhood and led to growth deficiencies creating a malocclusion and even constriction of the oral pharyngeal airway. This damage also seems to be causing significant pain and functional problems.

There are three different aspects to every patient who has damage in their temporomandibular joint foundation. These three components can vary from patient to patient, or for that matter, even from one side to the other in the same patient. The first of these is the actual structural damage to the hard and soft tissues of the temporomandibular joints. The CT and M.R. scans of your temporomandibular joints would indicate that you have severe damage in your left joint and severe findings on the right side. The second component of a T.M.J. condition pertains to the secondary structural distortion of the bite, the facial profile, and the pharyngeal airway dimension. Your degree of secondary structural distortion is severe. Perhaps more importantly, within reasonable medical probability, your secondary structural distortions project to be

non-stable long-term. The third aspect of a T.M.J. problem relates to the pain in the head and neck region. Your pain evaluation indicates that you have pain related to the temporomandibular joint and likely at least one other sore. Sometimes patients are led to believe that periods of minimal or no pain indicate that everything is going well. Still, structural damage to the joint and secondary skeletal changes can become progressive and severe despite pain patterning. Additionally, some patients may have high levels of pain with minimal to no structural damage in the joint foundations. It is prudent to consider all three areas in determining the best pathways for treatment.

We had a detailed discussion about your options for management, and this started with an overview of conservative or non-surgical pathways. Palliative treatment can be beneficial in reducing symptoms of pain and signs of the destructive breakdown of joint structures, although the outcome of non-surgical treatment can be variable. Additionally, conservative options may not prevent the progression of structural damage and pain. The following are four categories of palliative care from a conservative or non-surgical pathway:

#1-Rest and Reduction of Joint Function. The first type of conservative treatment relates to minimizing pressure on the hard and soft tissues of the joint surfaces. Damaged joint structures should be moved, but the pressure on the surfaces of the bone may have to be minimized. The analogy in the knee is that bicycling may be appropriate, but running or jumping may be contraindicated. Therefore, normal jaw movement can be maintained unless it elicits pain, and in that situation, the amount of jaw opening may have to be reduced. The greatest loading on the T.M.J. occurs when the lower jaw or mandible is protruded forward. As a result, biting with the front teeth may be more detrimental than chewing on the back teeth. We recommend that you try to minimize biting with the front teeth and think about chewing softer foods with the back teeth.

#2-Splint or Appliance Therapy. A second conservative treatment option is splint therapy. However, not all splints are the same. Some cover only portions of the front or back teeth, while others include the entire arch of the dentition. Splints may pull the jaw forward or push it backward. They also can be designed with various types of ramps. When thinking about splint therapy, it is best to fit the design to the damage of the joint foundation. As an example, pressure from the appliance on the front teeth, without the back teeth in supportive contact, will cause more strain to the joint surfaces. However, splints are frequently designed to separate the back teeth in an attempt to decrease muscle spasms, and patients with no or minimal damage in their T.M.J. foundations can wear this splint design without concern. Unfortunately, when the discs or bone structures are damaged and more fragile, the design of the splint should be converted to allow the teeth to touch simultaneously in the front and back, no matter how the lower jaw is positioned. Sometimes this design will increase the tendency to clench the jaw, but by bringing more of the back teeth into contact, the amount of compression or loading against the damaged joint surfaces is minimized. If you obtain a splint or appliance, it is our recommendation that it be designed as a full-coverage, flat-plane device that contacts the front and back teeth simultaneously during forwards and sideways movements of your jaw. As a more technical description, the splint should not have any guidance ramp for

the anterior teeth, and it absolutely should not be designed as a partial coverage splint. Should you obtain the splint from your own dentist, this description will cover the intent of our recommendations from the review of your C.T. and M.R. scans. You would wear the splint primarily at night to help you with your symptoms. Daytime wear is optional, but generally, we advise that the splint not be worn while awake.

#3-Chiropractic Treatment or Physical Therapy. Chiropractic or physical therapy can be a third alternative for conservative management. Generally, physical therapists will mobilize the mandible to help to improve the range of motion. They will also employ adjunctive modalities such as massage, dry needling, and ultrasound to decrease inflammation and muscle spasm. The prognosis for pain control may be improved by simultaneously working on both the jaw and the cervical spine. Since therapy can be quite variable from one patient to the next, we simply recommend that the chiropractor or physical therapist be given the discretion to use their own judgment in the modalities that they will use to treat their patients. However, we recommend against manipulation of the jaw in an attempt to "recapture" damaged or dislocated disks. The reality is that this can result in further damage to the ligament and bony structures.

#4-Pharmacology and Pain Management. Medications and pain management are the fourth area for conservative treatment. Typically, pharmacologic agents are aimed at treating joint inflammation, muscle spasm, and nocturnal clenching (vertical biting) or bruxism (lateral grinding). During episodes of extreme inflammation, it may be necessary to use a brief trial of corticosteroids, such as prednisone or a Medrol Dosepak. Generally, steroids should not be used more than five to six days at a time and one or two times per year. Nonsteroidal anti-inflammatory drugs (NSAIDs) are used for more chronic treatment of inflammation. However, it is still best to utilize these sparingly as they can cause abdominal pain, ulcers, hypertension, and cardiac problems in some patients.

Generally, we recommend budgeting the use of these medications to no more than ten days per month. Over-the-counter ibuprofen, 600 to 800 mg, three times daily, can be quite effective. By prescription, we prefer Relafen, 500 mg, twice daily. For the treatment of spasms, there are many choices for muscle relaxant medications, but when used incorrectly, many of these have a risk for addiction. When taken as prescribed, Flexeril 5-10 mg, 2-3 times daily, or Klonopin 0.25 to 0.5 mg, 2-3 times per day, are relatively safe. However, muscle relaxants should never be combined with other sedating medications or alcohol. The last medication for conservative treatment of T.M.J. problems is taken at night to control jaw clenching. For most patients, we treat bruxism with trazodone, 50 mg at bedtime. Some patients may wish to pursue further treatment with pain management centers, and these physicians may offer many additional options, such as nerve blocks, Botox, or even narcotic medications.

Patients diagnosed with CRPS-1 may require more complex pharmacology and pain management. It may be necessary to consider additional medications for stabilization of nerve conduction, such as gabapentin (Neurontin) or pregabalin (Lyrica). Some pain management doctors also may recommend treatment with intravenous ketamine, which has shown to be effective in many chronic pain conditions. More specialized nerve blocks

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to sympathetic nerves may be indicated as well. CRPS-1 patients who suffer from additional sources of musculoskeletal pain should consider the simultaneous treatment of both conditions.

We want you to understand that these conservative options will not repair the disc or reverse bone damage. Moreover, these non-surgical alternatives will be aimed at trying to reduce pain and to minimize progressive degeneration of your temporomandibular joint discs and breakdown of the mandibular condylar heads. However, much like bony arthritis and soft tissue injuries in the knee, damage of temporomandibular joint structures may progress even though symptoms of pain may be minimal, high, or variable.

Because of the abnormalities that you have in your temporomandibular joints, we also feel that surgery is a reasonable alternative for you. Here at the Piper Clinic, we have several surgical procedures that we can offer to patients, with each matching the degree of temporomandibular joint damage. These options can vary from simple joint lavage or arthroscopic surgery to much more major reconstruction of the soft tissues or bony structures of the temporomandibular joints. The simpler surgical options are minimally invasive, and generally, these are aimed at providing temporary pain relief. It is unrealistic that significant joint damage can be repaired through joint lavage or arthroscopy. More frequently, we recommend arthroscopy primarily as a diagnostic option if patients are not able to have a magnetic resonance scan. Additionally, we find that arthroscopic surgery is not a long-term solution for more serious injuries to the temporomandibular joint. In fact, patients undergoing this type of operation may suffer from progressive joint surface damage and scarring.

Most of our patients present with Piper Stage IV or Stage V disc displacements, and in this group, we are focused on either repairing or replacing the temporomandibular joint disc. For a disc to have reasonable repair potential, it must have adequate dimension and shape so that it can be fitted over the mandibular condylar head. Typically, the ideal injury for repair and retention of the disc is Piper Stage IVa; however, IVa discs that are more distorted may have to be replaced by the fat graft procedure, which is described in the following paragraph. The repair process is in the ligaments that hold the disc, as it is these ligaments that have stretched, thereby allowing the disc to dislocate. With a repair procedure, the disc is repositioned through the tightening of the ligaments. These ligaments then must be protected for several months by holding the bite in a very precise position. This is typically accomplished by having braces on the teeth. A splint then is worn with the braces, and we ask patients to place elastics on their braces to hold the bite very precisely into the splint device. We then give a specific protocol as to the amount of time that the splint would be worn. This approach would be very similar to having a procedure on the ankle, protected postoperatively by wearing a boot that can be placed and removed periodically. Overall, disc repair surgery typically gives excellent long-term pain relief, and the risk of subsequent breakdown is approximately 4-5%. However, a repaired ligament system does not hold up well to additional traumas such as overstretching of the jaw or whiplash-type injuries. Patients undergoing this disc repair procedure should think carefully about minimizing their exposure to potential facial traumas.

The outcome of retaining and repairing the disc in very advanced damage is more tentative, and typically, we do not attempt to repair Stage IVb, Va, and Vb discs. As a backup to the disc repair procedure, here at the Piper Clinic, we have developed a surgical technique to replace the disc with autologous fat, which is harvested from the patient's own body. Typically, a small incision is made on the lower part of the abdomen or hip, and the fat is directly underneath the skin surface. This procedure does not involve getting into the muscle layer of the abdomen or buttocks. The fat is then placed into a small syringe and injected into the temporomandibular joint. The original disc is always removed to eliminate the painful herniation of this tissue into the musculature around the joint. If possible, with the fat graft, we maintain the retrodiscal attachment. This is part of the ligament system that adheres to the posterior part of the disc, and if we can maintain this tissue, it may serve as an additional blood supply to the fat graft. The protocols after fat graft surgery are very similar to those that we follow after a disc repair procedure. We again utilize a surgical splint with the braces and elastics for several months of healing time.

Damage to joint structures always results in a change in the alignment of the bite. Disc repair or replacement procedures are designed to improve this altered bite relationship. However, patients may have residual bite discrepancies, even though we do our best to improve the alignment. Therefore, at the end of healing from either the disc repair or the fat graft procedure, a second stage of treatment may be necessary to realign the bite. At approximately nine months following the original surgery, we will do a reevaluation of the bite or occlusion. Most bite discrepancies can be normalized with dental equilibration (bite adjustment), restorative dentistry (crowns or onlays), or orthodontic tooth movements. However, a small percentage of patients who suffer from more serious joint and bite abnormalities may require a second-stage bite corrective surgery. In planning the T.M.J. surgery, we attempt to improve the bite in order to avoid more complicated second-stage options. It can sometimes take several months before we know whether or not bite corrective surgery will be required.

Additionally, some patients have very fragile mandibular condyles, and neither conservative dental therapies nor bite corrective surgery can fully reverse the distortion of their occlusion and profile. This subgroup of patients might have to eventually proceed to rebuild the condylar bone with either a bone graft or an artificial joint. Hence, there can be several options that might be necessary for the corrective bite phase of management after the healing from the T.M.J. surgery.

Of all the non-surgical or surgical options, the best match for you would be bilateral total joint replacement with simultaneous correction of the maxilla with a LeFort I osteotomy and correction of the chin with a sliding genioplasty. We had a long discussion weighing the pros and cons of proceeding with total joint replacement and both decided this would be your best option. The amount of damage you have currently would make fat graft reconstruction incredibly unpredictable. We would project from the current condition of your temporomandibular joints that after T.M.J. surgery, your bite will most likely require

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finishing orthodontics. Additionally, from our review of your C.T., you would benefit from chiropractic adjustment of your upper cervical spine during the week following your T.M.J. surgery. The combination of T.M.J. surgery and realignment of your cervical spine should significantly reduce your pain patterning. However, nerve blocks may also be of benefit both during and after surgery. The surgery is performed under general anesthesia, and nerve blocks and medications are given as a part of the anesthesia to help with the control of postoperative pain.

Additionally, intravenous ketamine is given while patients are asleep, and this can have a lasting improvement in the treatment of chronic pain. Finally, patients with autonomic system pain (CRPS Type-1) may require additional nerve blocks to their stellate ganglion by the anesthesiologist at the time of the surgical procedure. Currently, we do not project that you will need a stellate ganglion nerve block.

Delay of surgery may result in an increase in a worsening of the damage in your temporomandibular joints; however, no one can predict exactly how quickly the progression of degeneration will occur. Therefore, if we have recommended surgery, but you elect to follow a non-surgical pathway, it would be important to intermittently rescan the temporomandibular joints with magnetic resonance imaging. We generally recommend rescanning with M.R. every six months. Repeat CT scanning may be indicated if there are significant progressive changes in the bite alignment.

As you indicated to us during your consultation visit, you expressed interest in surgery. In the meantime, our office would be happy to share your findings with your insurance carrier to obtain a predetermination of your benefits. To help with your communication with the Piper Clinic, we have assigned Tanille as your patient care coordinator. If you have further questions for us, you can communicate through the patient care coordinator or request a telephone conference with one of the physicians. After you have had an opportunity to review this report, we would like you to have a scheduled phone appointment with your patient care coordinator so that they can update us with your thoughts about how you would like to proceed. If you would like further services from us, your patient care coordinator can schedule these for you. Alternatively, if you would like to decline treatment with the Piper Clinic, we would simply request the courtesy of having you share these wishes with us.

We want to thank you for the honor of seeing you at the Piper Clinic as a patient. We know that your consultation workup was a very long day, and your patience in allowing us to go through all your diagnostic testing was greatly appreciated. Finally, it was our pleasure meeting you and seeing you here at the Piper Clinic as a patient. If you decide on proceeding with follow-up care with us, we will do our very best to help you with your problems.

Sincerely,

Dr. Anna Minnema
March 08, 2022

A handwritten signature in black ink that reads "Brian S. Shah". The signature is written in a cursive style with a large initial 'B'.

Brian S. Shah, D.D.S., M.D.

Dictated: March 08, 2022
Transcribed: March 08, 2022
PROOFED: B.S.S. [BDS]