The "synovials" of the capsule;

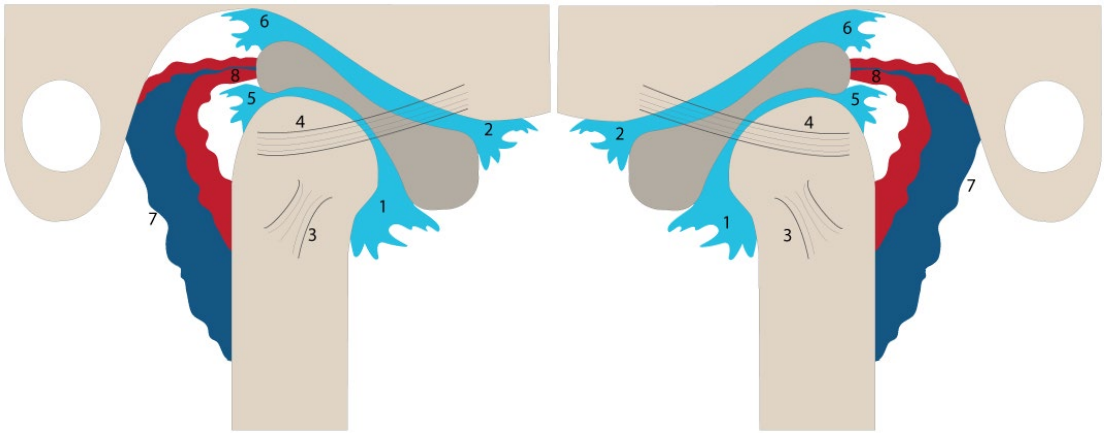
The capsule attaches to the circumference of the joint. It can become stretched in the case of a hypermobile condyle, or restricted in a capsular pattern, resulting in restricted downward movement of the condyle.

Associated with the joint capsule is synovium. This is a highly vascular and well-innervated connective tissue structure that lines the upper and lower joint compartments of the TMJ. The synovium produces synovial fluid and exchange nutrients and waste products between the vessels of the capsule and synovial fluid / articular tissues.

Certain areas of the capsule have been identified as being particularly sensitive on palpation around the TMJ; most likely thickenings in the synovial lining of the joint. Rocabado refers to them as synovials. The major significance of the synovials lies in their proprioceptive role - providing us with "within-the-range" information. More specifically the inferior synovials give us information as to the condylar position - while the superior synovials give information as to the position of the disc, relative to the temporal surface.

Tenderness of the synovials can indicate TMJ dysfunction and they can be traumatized with excessive joint motion/translation.

Rocabado Pain Map



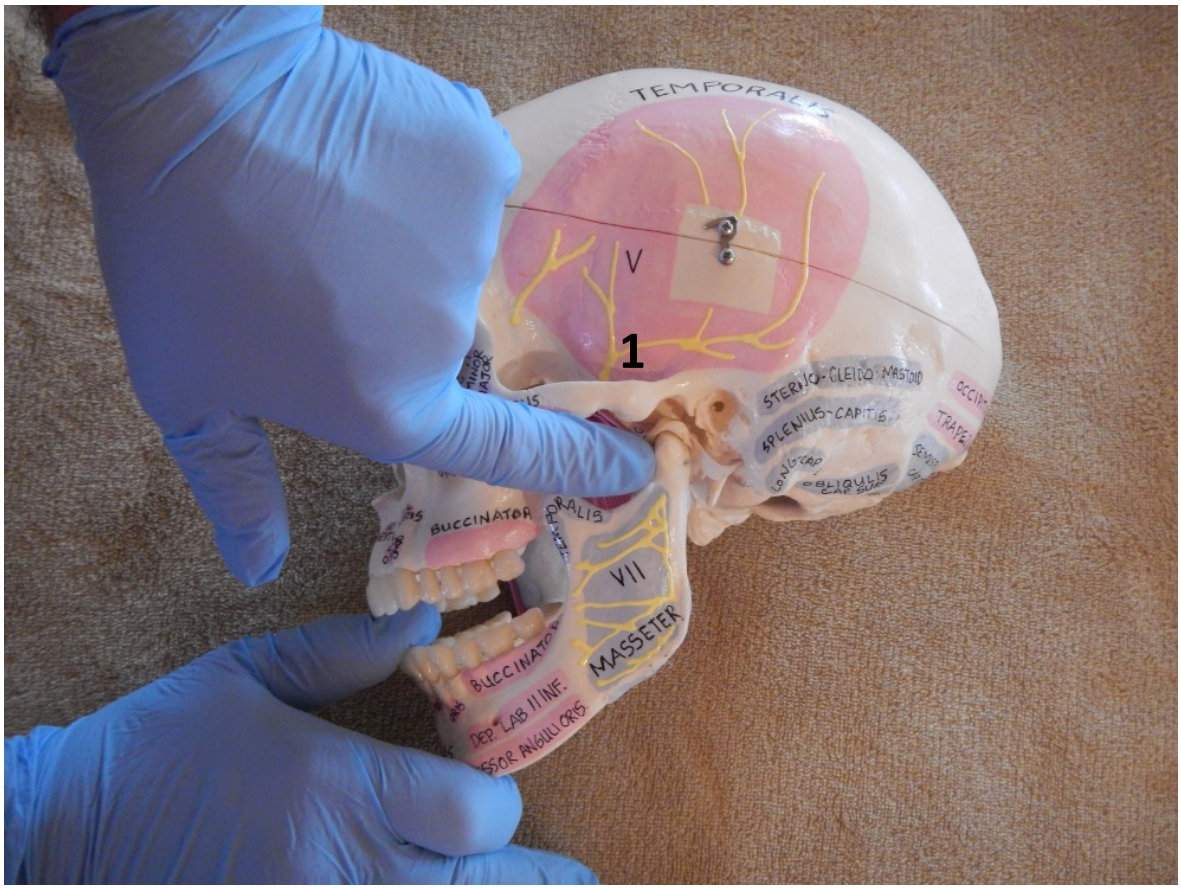
1. Anterior Inferior Synovial
2. Anterior Superior Synovial
3. Lateral Collateral Ligament
4. Temporomandibular Ligament
5. Posterior Inferior Synovial
6. Posterior Superior Synovial
7. Bilaminar Zone
8. Retrodiscal Tissue

In General, the Anterior Inferior and/or Posterior Inferior Synovials (pain #1 and #5) hurt by compression of the condyle, from functioning in the direction of extreme anterior or posterior directions. (Basically gives you position of condyle)

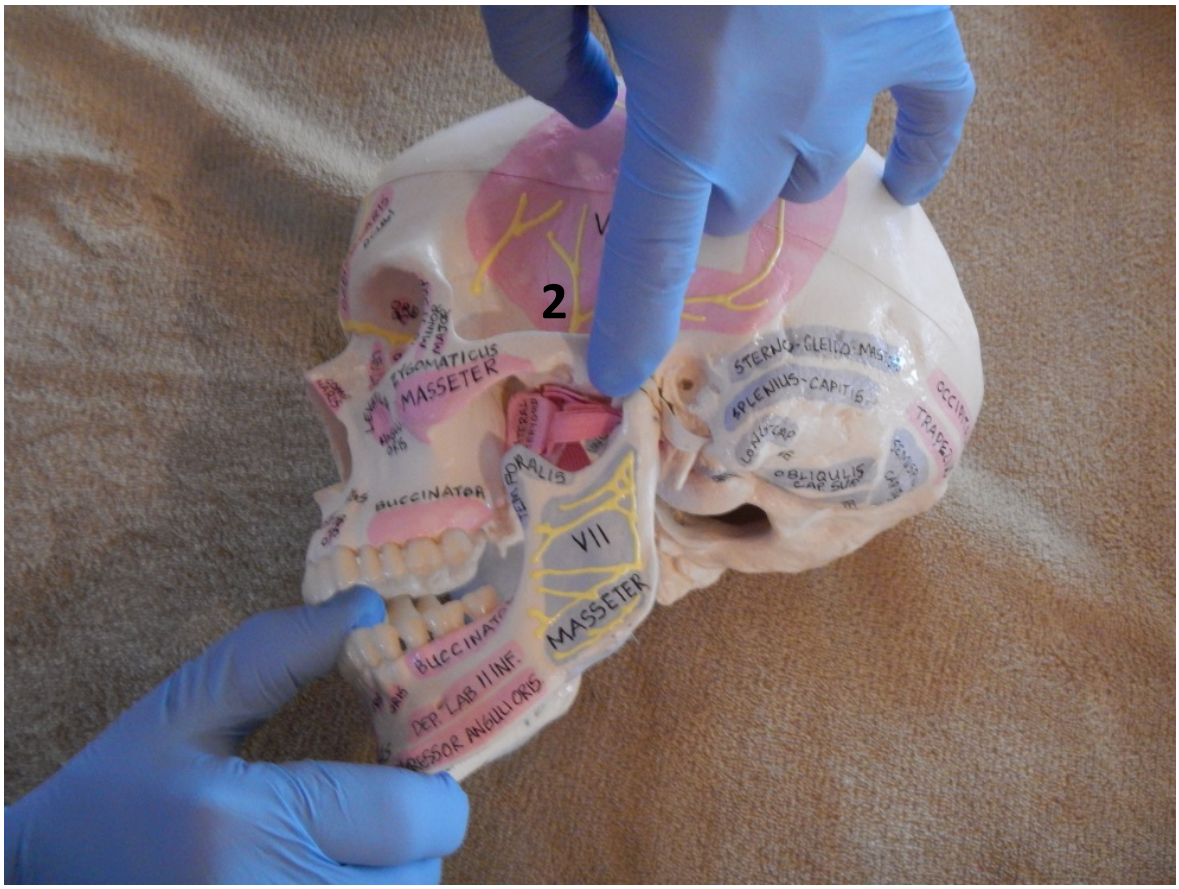
The Superior anterior and/or Superior Posterior Synoviums (pain #2 and #6) hurt when the anterior or posterior dense portions of the disc compress the disc-fossa articulation and disc eminence articulation, by moving beyond the insertion of the anterior articular capsule. (It gives you position of the disc)

To begin with locate the lateral pole of the condyle where it is palpable. Gently place the index finger under the zygomatic arch. Ask the patient to protrude the mandible until you feel the anterior pole of the condyle – "DO NOT LOSE IT" open mouth 10mm. Maintain this position as patient gently bites down on your thumb.

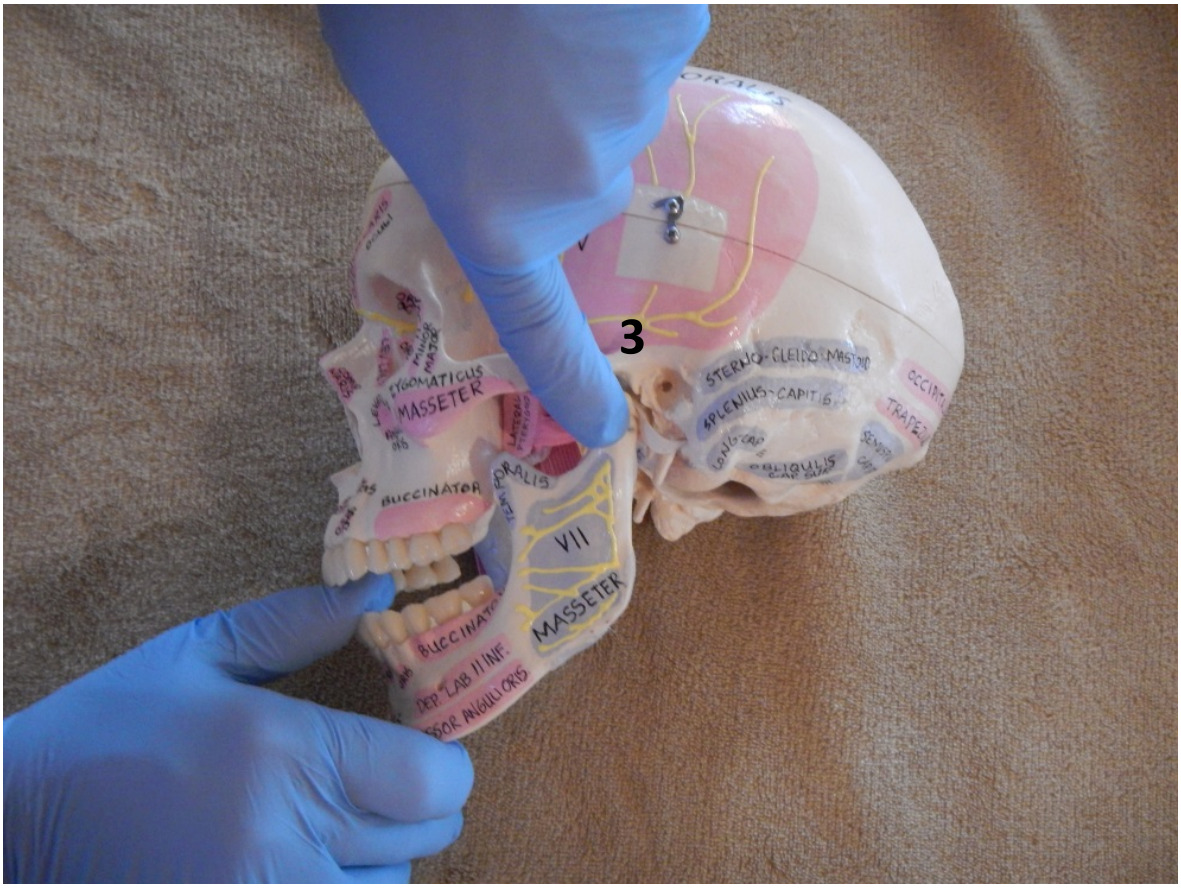
Now to find Pain #1 (anterior inferior synovial), roll the index finger towards the anterior inferior pole of the condyle and palpate the soft tissues, until you feel the hard tissues, which will be the neck of the condyle. Pain here indicates hypermobility with the condyle repetitively protruding (like biting ones nails) or excessive mouth opening, in which the condyle compromises the anterior-inferior synovium.



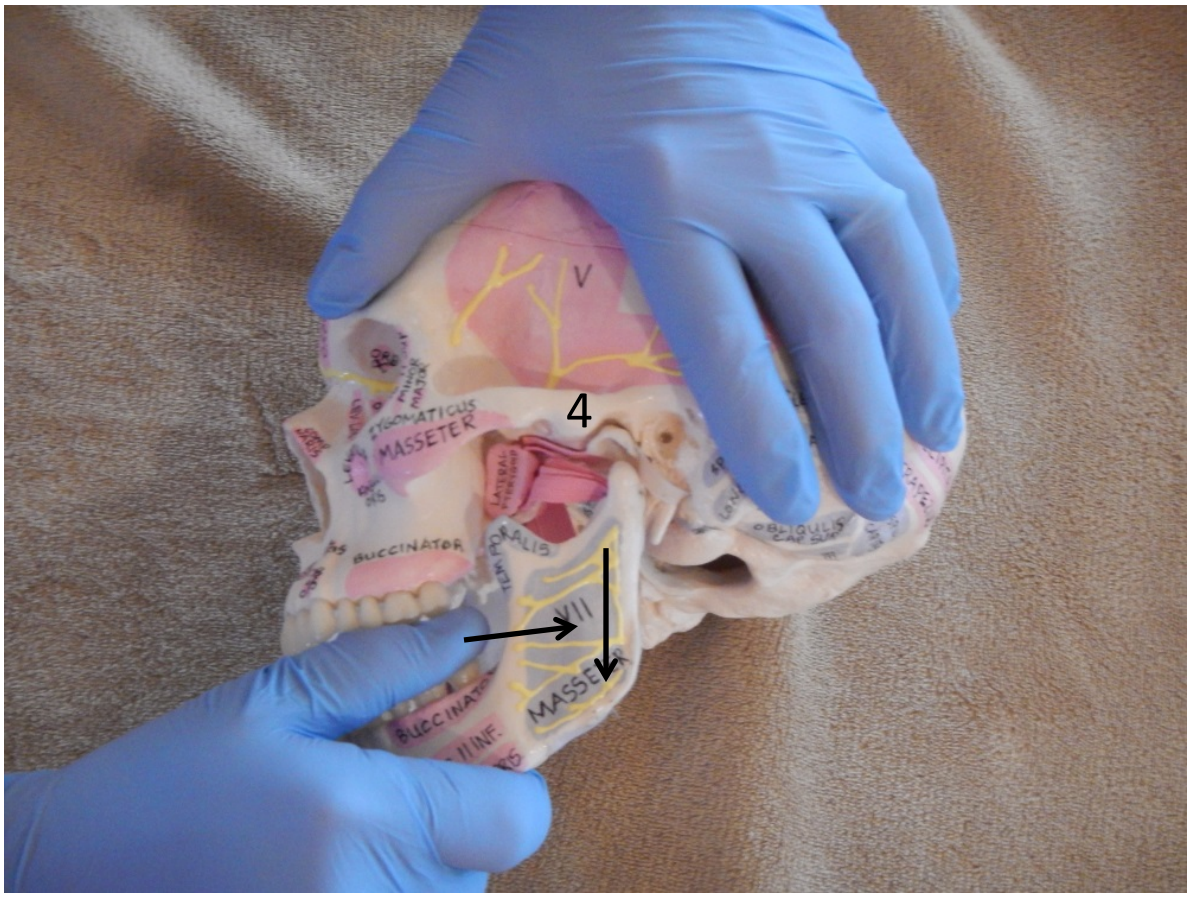
Now to find Pain #2 (anterior superior synovial), maintaining index finger contact on the anterior pole of the condyle slide up, superiorly, until you palpate the anterior superior border condyle against the inferior border of the articular eminence. Pain here usually relates to the anterior/superior dense portion of the disc, typically due to excessive disc motion.



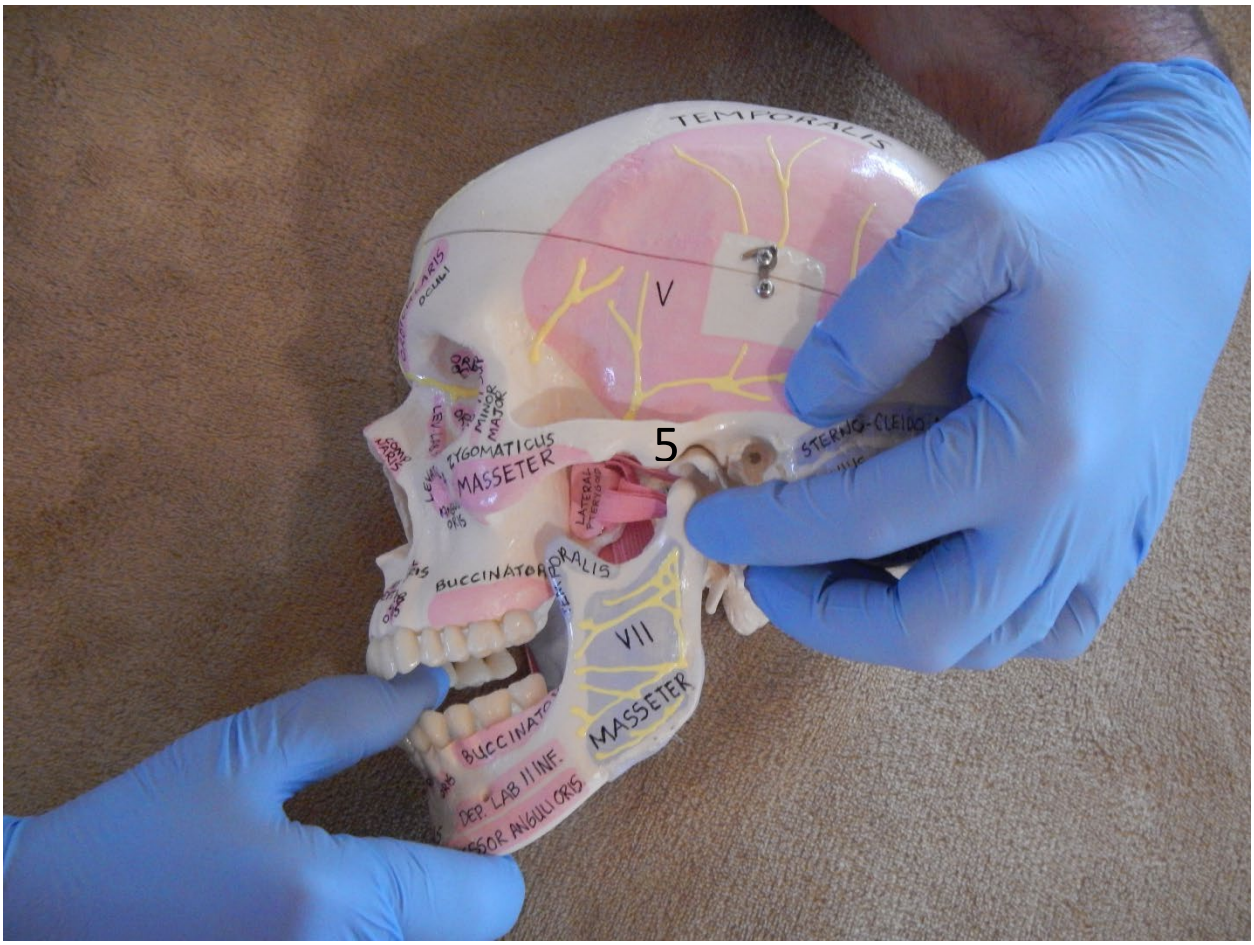
Now to find Pain #3 (LCL), palpate with mouth open the lateral pole of the condyle with the index finger, feel translation under the inferior border of the articular eminence. Pain here usually is indicative of hypermobility, with progression towards medial disc subluxation, which causes a sound (click) and/or limitation of lateral excursion to the opposite side.



Now to find Pain #4 (TML), intraorally using your thumb placed over the mandibular molars or premolars, we will test this ligament by taking the mandible back and down. This is a provocation test not palpation. Pain here usually indicates important pathology. When the condyle moves posterior inferiorly, implies joint instability of the disc. We then lose joint surface congruency between the surface of the condyle and the articular eminence, opening the space. This can create an anteriorly luxated disc due to parafunctional activity of the posterior temporalis, medially by the superior lateral pterygoid, and laterally by the deep masseter muscle. An occlusal interference can cause this as well, as there is tooth contact, the mandible can pivot posterior and inferior as teeth come into full contact.

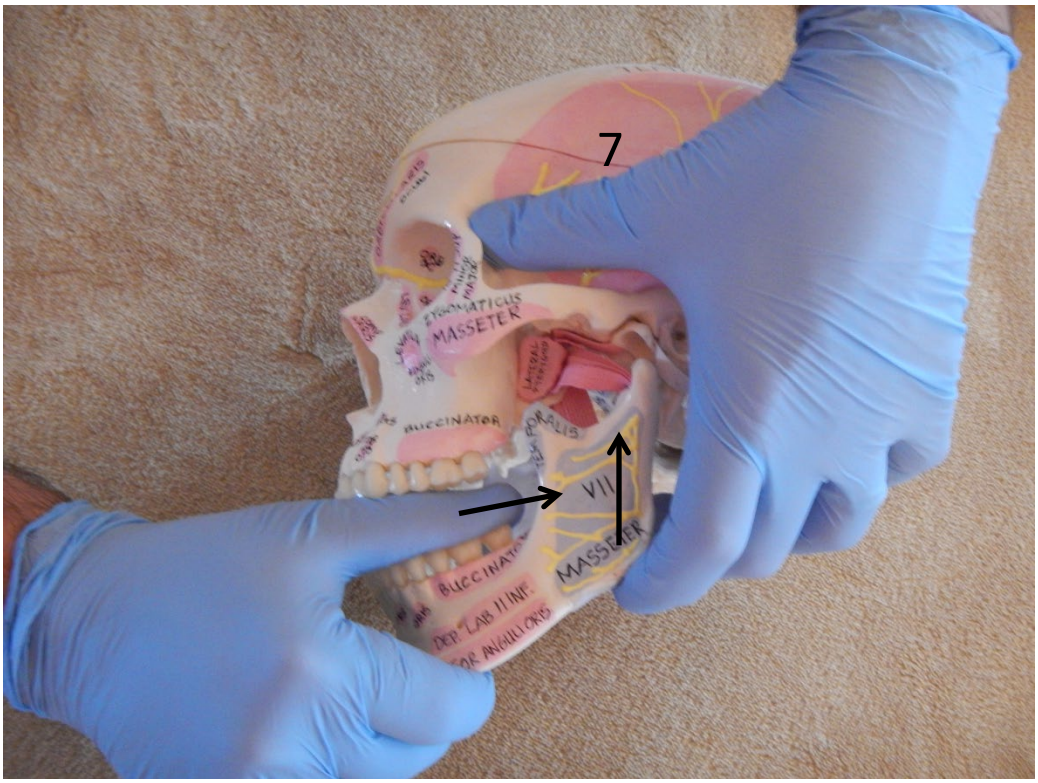


Now to find Pain #5 (Posterior Inferior Synovial), locate the lateral pole of the condyle , now open about mouth half way or with lateral excursion to the opposite side, slide your finger posteriorly towards the neck of the condyle. Pain here is the result of excessive backwards and downwards movement of the condyle, stretching the inferior synovium of the capsule posteriorly. Pain #5 is probably the start of posterior condyle-disc displacement (subluxation) starting to take place.

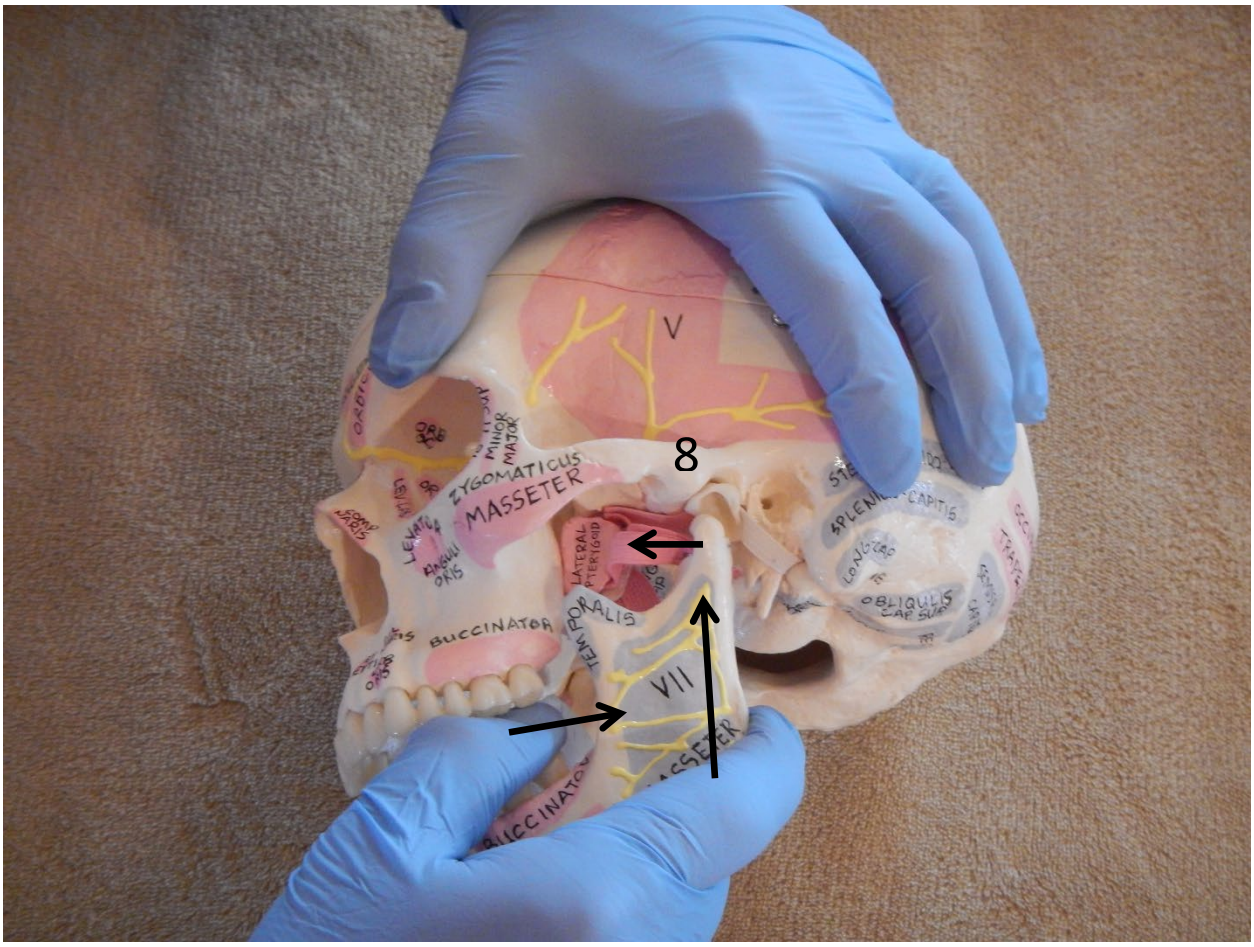


Now to find Pain #6 (Posterior Superior Synovial), locate the lateral pole of the condyle, now open about mouth half way or with lateral excursion to the opposite side, slide your finger posteriorly towards the neck of the condyle as in pain #5. Now slide your finger superior towards the temporal fossa. Pain here usually relates to the posterior/superior dense portion of the disc. It indicates condylar compression on the posterior aspect of the disc. The condyle is too far posteriorly, relative to the disc.

Now to find Pain #7 (Bilaminar Zone), intraorally using your thumb placed over the mandibular molars or premolars glide the mandible or condyle posteriorly and then add cranial (superior) compression through the mandibular angle. Pain here incriminates the retrodiscal area, recognized as the posterior ligament or bilaminar zone. This tissue is highly vascularized and innervated tissue which has 2 bands connecting the posterior dense portion of the disc with the posterior temporal fossa and the posterior band of the disc to the posterior inferior neck of the condyle posteriorly. Due to the neurovascular histological condition of the bilaminar zone this is not a ligament by definition. Through this bilaminar zone the TMJ receives collateral blood supply to the trabecular bone of the condyle posteriorly. An anteriorly displaced and deformed disc with condyle moving and compressing the bilaminar zone. Condyle can no longer translate forward without compressing the insertion of the posterior ligament onto the disc.



Now to find Pain #8 (Retrodiscal Tissue), intraorally using your thumb placed over the mandibular molars or premolars glide the mandible or condyle posteriorly and then add cranial (superior) compression, so having repeated same maneuver as pain #7, maintain cranial pressure and slide condyle forward, and/or ask patient to assist by protruding mandible. This creates posterior, superior cranial pressure, if pain is intensified, then this is retrodiscitis. This relates to the posterior edge of the disc, as the disc is anteriorly displaced, and translation of the condyle impacts on the posterior disc.



Summary of the Pain Maps

In conclusion we can say that:

- Pains #1, 5, and 8 are due to compression by the condyle
- Pains #2 and 6 are related to the disc and point to the anterior and posterior dense portions of the disc respectively
- Pains #1 and 3 are related to the condyle; possibly parafunction
- A shift from anterior to posterior synovial pain indicates that a disc displacement is taking place

Reference: Atlas Clinico 1, Rocabado 2011