

Category Eight – The Occipitoatlantal Complex

We welcome you to this article, the sixth and final in the 1970 eight category system. We have used the structure of the 1970 system to discuss the topics DeJarnette thought important enough to, at that time, call Category IV (Occipital fibres), Category V (Trapezius fibres), Category VI (Anterior vertebral subluxation), Category VII (oblique sacrum) and Category VIII (Occipitoatlantal).

Our use of this structure has enabled us to expand on the information you would have received at a basic SOTO A/Asia seminar series. In writing these articles, we have been able to review many historical aspects in the development of SOT, have been able to include some DeJarnette practicalities and have attempted to include concepts, research findings and techniques from various and varied chiropractic sources. The eighth category – occipitoatlantal article covers one of the two most studied areas of chiropractic, the other of course being the sacroiliac. With that DeJarnette maxim – “either the occipitoatlantal system locks out the sacroiliac balance medium or the sacroiliac balance mechanism locks out the occipitoatlantal¹ – firmly in mind, here is a brief history of the Upper Cervical in chiropractic (with some DeJarnette experience), a study of the biomechanics of the region and a discussion of some procedures offered by DeJarnette.

Upper Cervical History:

Dr. DeJarnette in one of his writings on the conceptual developments of SOT, wrote about the influence of one of his teachers at the Nebraska Chiropractic College, Dr. Carl Hawkins, who had invited DeJarnette and classmates to, “Look carefully at the occipital condyles because they are really important.”

DeJarnette relates how some six years after graduation, he was reviewing his class notes and this led to another take on the occiput – the discovery of the occipital fibres, by 1930.² Over the years of Chiropractic development from this 1930 landmark event to the writing of the final Sacro Occipital Technique manual, 1984, the occipitoatlantal region remained an important aspect of Category protocol and remains so to this day.

Around this time, the early 1930s, is the start of the Upper Cervical Specific era of chiropractic which sees three main chiropractors actively pursuing knowledge of this area – Dr BJ Palmer, Dr Albert Wernsing and Dr John Grostic.

(Fig. 1)

Dr BJ Palmer was the developer of the Torque-Toggle-Recoil adjustment and the HIO (hole-in-one) approach to chiropractic. This was the mainstay of the Palmer school of Chiropractic from this period up to 1956, when Dr Herbert Marshall Himes suggested some diversified technique be introduced into Palmer’s core curriculum (some say, unfortunately).

Dr Albert A. Wernsing, now that’s a name which never gets mentioned! He is the father of vectored adjusting, being the first chiropractor to take a nasium view which he termed “the true AP” – a view still used today. Wernsing was the first to measure the atlas in degrees of displacement from the skull condyles and stated “the atlas moves laterally as if on the rim of a circle, and due to the shape of the articular surface of the atlas and its condyles the most practical method of listing the relative position of an atlas, in relative position to its condyles, would be in the division of a circle, namely “in degrees.”⁴

(Fig. 2)

Dr. John Grostic Senior (his son, Dr. John Grostic Junior was lecturing at Palmer in the 70s and 80s and unfortunately died at quite an early age) further developed the orthogonal – right angle idea of Wernsing’s and included other procedures including the vertex view and lateral views and worked on the extremely light adjustment of the upper cervical known as the triceps pull.

Dr. Ralph Gregory continued the promotion of by hands only/triceps pull Grostic work upon Dr. John Snrs. death in the 1960s and this group continued (and continues) upper cervical teaching and research and is known as NUCCA – the National Upper Cervical Chiropractic Association.

In the late 1950s, Dr. Cecil Laney, an Alabama Chiropractor, made the first upper cervical hand held instrument – which influenced the upper cervical bench instruments of Pettibon, Sweat and Harrison.

Now, without going too “out of communication” with those of you who don’t know this work, let us describe three listings which are needed to be known to appreciate the next historical point of development, the Harrison and Wong study.⁵

Upper Cervical degree measurement is made by comparing the atlas plane line with the central skull line, which dates back to Wernsing.

The lower angle line, which Grostic indicated as the centre of the neural canal, can be compared with the skull’s centre line. Thus in figure 3, we see a perfectly aligned skull, atlas and lower spine where the atlas plane line is 90° to the central skull line and the lower angle.

(Fig. 3.)

Figure 4 shows an “into the kinks” subluxation as the degrees of displacement are on the same side.

(Fig. 4.)

Figure 5 shows an “against the kinks” subluxation as the degrees of displacement are on opposite sides.

(Fig. 5.)

Figure 6 is the “head subluxation whereby the misalignment is “as if on the rim of a circle” with no lower angle displacement.

(Fig. 6.)

Now these three types were used in vector adjusting by Dr. John Grostic, Dr. Ralph Gregory and any one they taught including Drs Burl and Grover Pettibon who took the Grostic seminars in the late 1950s and Georgia’s Dr. Roy Sweat (also a Grostic seminar attendee of the 1950s) and others.

A big development in interpretation of the “types” took place in 1980 when Dr. Don Harrison (any article by Harrison is worth reading and you know you are getting old when reminded by a student chatting with us at a recent seminar who said ‘Don Harrison, that’s Deed Harrison’s dad isn’t it?’ Yes it is.) and co-worker Dr. Harry Wong found if they turned a patient through degree postural increments, they could create the angles one sees in an “into” or “against.” Thus, Harrison and Wong took the direct AP Nasium view first then turned the patient’s shoulders 10° using a protractor, then 20°, then 30° etc. and looked for changes in the resulting line drawings.

Harrison determined that an “into” was in fact a lateral flexion motion form and the “against” was a rotation global motion-form.

A different approach to the Upper cervical was the non-orthogonal viewpoint as offered by Dr. William Blair. Whereas Grostic, Pettibon, Sweat and other ‘Orthogonal’ practitioners were zeroing out the skull, Blair suggested that a fair percentage of the time, malformations of the condyles would prevent there being a 90° relationship between atlas plane line and the centre skull line – the method used by Grostic, Gregory Sweat, Pettibon et al.

Blair's principle of Occipitoatlantal misalignment states that⁶:

“In non-fractured, non-dislocated misalignments of the occipito-atlanto articulation, one atlanto lateral mass travels longitudinally, either anteriorly or posteriorly (whichever the case might be) along the longitudinal articular axis of its corresponding occipital condyle while the partner lateral mass travels either transversely or obliquely and in a plane parallel to the longitudinal axis of the articulation presenting true longitudinal misalignments.”

We will discuss more about the rotation, lateral flexion and translation components in the practical section, after we have looked at this next part, a biomechanical review.

Biomechanics

When studying the biomechanics of the upper cervical region you have to ask the questions – does the occiput-atlantal allow for any rotation movement; does the atlanto-axial allow any lateral flexion and does it matter?

A good place to start is in a study of the mechanics of this region is an overview from two good sources and none finer than DeJarnette's along with those of Dr. Roy Hildebrandt. Dr. Hildebrandt has been Associate Professor of Radiology at both Palmer College in the 1970s and Chicago's National College in the 1980s onwards, and while at each college he wrote a textbook called “Chiropractic Spinography.” The first edition in 1977⁷ is a different book to the 1985⁸; both make for good reading material. Let us start with Hildebrandt's “Occipitocervical complex” from the chapter “The Postural Complex of the Human Body.” Hildebrandt states:

“The Occipitocervical complex (occiput, atlas and axis) is intricately designed to function as a balance mechanism for the head in static postural accommodation and in locomotion; such design being oriented to the objectives of the vestibular apparatus in their efforts to maintain the head in balance around its centre of gravity. This centre of gravity of the head constitutes a point of vector around which all movements of the head on the atlas and axis seemingly take place. These movements, on the three body planes are described as follows:

A. Occipitoatlanto articulation

1. On the sagittal body plane, the head may anteroflex and retroextend on an axis of pivot transversely through the vestibular apparatus of the inner ear. This is allowed by the occipital condyles rocking and gliding posteriorly on the atlas lateral masses in flexion and by rocking and sinking anteriorly on the axis lateral masses in extension, this later “sinking” action being effected as a result of the posteriorly divergent angle of the condyles and lateral masses.
2. On the coronal body plane, the head may laterally flex on a sagittal axis through the point of bisection between the vestibular apparatuses, this action being allowed by the lateral incline of the condyles and lateral masses (Wernsing's “as if on the rim of a circle”).
As the head is flexed laterally, the condyles on the side of flexion “sink” downward into the corresponding lateral mass, and on the opposite side the condyle rides upward on its corresponding lateral mass.

(Fig. 7)

3. On the transverse body plane (in Hildebrandt's opinion) there is no true rotation between the condyles and atlas lateral masses, this being due to the effect of their convex/concave design. However, when the combined sagittal and coronal plane movements are considered on a three dimensional basis, a screwlike movement is allowed around a vector at the centre of the head – the head (rather than rotating on the atlas) may move in a screwlike action on the atlas while maintaining its point of vector at the centre of gravity at the head.
In order to completely accomplish its objective as a balance control mechanism for the head, the atlas requires the biomechanical support of the axis, on which it rests and on which it depends for certain complimentary movements. These movements between the atlas and axis may be described as follows:

B. Atlantoaxial articulation:

1. On the sagittal body plane the atlas may anteroflex and retroextend on a transverse axis at the upper aspect of the odontoid process, with the inferior articular processes of the atlas gliding anteriorly in extension and posteriorly in flexion on the superior articular process of the axis.

2. On the coronal body plane (again, this is Hildebrandt's opinion with some texts suggesting zero C1/C2 lateral flexion) Hildebrandt suggests the atlas may laterally flex on the axis in an arc, with its axis or pivot located at some point in the lower cervical area. This movement is characterised by the atlas sliding downward on the side of flexion and upward on the side of extension due to laterally inclined design of the atlas-axis articulations.

3. On the transverse body plane the atlas can freely rotate (up to 90° in each direction) on the axis, the point of pivot being around the odontoid.

Now to DeJarnette who had this to say on the subject of Occiput-Atlas rotation⁹: “The argument will go on for ages as to the rotary ability of the occipitoatlantal condyles. You can answer any way you wish and still be half right, but to be fully right you must accept moderate rotation as part of the occipitoatlantal system. If you accept only nodding motion you are only half right.” Now, that said, DeJarnette reminds us that the main thing about the occipitoatlantal articulation is that it is nodding articulation in which the condyles of the occiput rock back and forth, up and down, onto and into the condyles of the atlas.

DeJarnette gives a good account of the nodding action's importance to the functioning of the dural membranes. Two sources which we have frequently used in this series are the final manual – 1984 SOT and the PAS (Philosophy, Art and Science of SOT, 1981). From these we have: “The Condyles of the occipital bone are simple, yet suitable to the services they perform. No other type mechanical arrangement could so well control skull motion and afford skull protection as does this condyle system. Any other system would not last through two years of life. The skull has to rock back and forth to function. If it cannot rock, you cannot breathe, so there you go. The rocking motion of the skull is essential to maintain tension in the dural membranes for nourishment and protection of the spinal cord and its system of nerves. This rocking motion is necessary to provide ventricular function for the distribution of cerebrospinal fluid. This rocking system is necessary to protect the brain and spinal cord against those ever-occurring jars and jolts which a facet system would resent and would fail to provide the type motion necessary for defence.”

DeJarnette's main concern in the occiput-atlas area was the flexion-extension component; he was also on the lookout for an occipital side-slip and compression and examined for a dural imbalance which we will discuss.

DeJarnette's techniques:

Of the three DeJarnette procedures in vogue in the 1970s and 1980s, only the condyle rocker seems to have continued as the technique of choice in SOT procedure for this area. The side slip and compression subluxation needs perhaps to be understood and looked for more in SOT circles; a fact emphasized by Dr. Keith Bastian in his Category II instruction of the 1980s (the importance of the cervical compaction test as mentioned in our “Expression” Summer 2006 article). The third procedure, the cervicocranial dural technique, is an enigma. Of this procedure, DeJarnette stated: “This particular phase of SOT could well become a total technique within its own scope, but it is used here to make sure your procedures are not being inhibited by contraction of one or more of the dural membranes.” Let us start the technical discussion with this one.

1. The Cervicocranial Dural Technique

This is an uncomplicated cervicocranial movement done with patient supine and doctor seated at the head of the table. The basis for this technique is the inability of the three dural membranes to properly tract and react to head movements.

Is it applicable to all categories? Answer yes. Is it a good technique to do with the healing category II patient? Also answer yes. One of the physical signs of the category two patient is that the

cervical spine does not turn equally right and left. This technique is extremely simple in application yet DeJarnette described it as a technique with “limitless application” which, in fact, should be established as a patient care routine.

The technique is:

Your left hand cups the left occiput with your thumb anchored onto the left mastoid. Your index finger is basically circling the atlas.

The patient’s face is turned to his or her right very slowly by placing your right hand onto the left side of the face and letting the weight of your hand slowly depress the chin to the right.

Resistance will be felt in most cases when face is turned right or left and will be greater on one side than the other. You do not use force, simply the weight of your facial hand, and as relaxation begins, you can gently increase the weight of your hand by increasing force to a limited degree.

When this right face turn has been completed by the resultant relaxation of the cervical tissues, you simply change hands, the right hand then positioned so it cups the right occiput and rests thumb upon the right mastoid process. The left hand is now the right facial hand and gently forces the face to the left. A good technique? We think so. You try it and let us know your findings.

(Fig. 8)

2. The Occipitoatlantal side slip-compression technique.

On this subject, DeJarnette stated that “this is purely mechanical observation, easily confirmed by proper x-ray examination (in the Grostic-type listing you are going to see it present as an into-the-kinks or a head subluxation pattern).

There is a lateral skull “tippage” as the patient stands. This gives the skull a low and a high side. Commonly, the leg will be short on the low side in the supine position; yet we have to take Categorisation and the timing into account. Thus, if the cervical compaction test indicates cervical spine and you have a side slip then what would you be doing blocking the patient Category II? As for further differentiation, DeJarnette noted that as well as the visual analysis with the distortion analyser, the laterality findings on x-ray and the short leg supine, there was also a painful fibre-muscle band on the high side/long leg side from occiput running downwards over the atlas-axis region. The occipitoatlantal side-slip presents with the eye sockets, same size right to left as opposed to a cranial fault in which the eye socks will present as being different in size.

Let us illustrate a left side-slip and a right compression.

(Fig. 9)

The correction almost becomes automatic when you properly visualise this one. You have the patient supine, with the right index finger traction lifting the occiput using the mastoid process as a lever. The left metacarpal joint of the index finger contacts around the area of the taut fibre on the left and will thrust sideways to the right. The adjustment, then, consists of two parts – traction on the right and side movement on the left.

One last point is that with the “side slip” and compression will come some rotation (remember Hildebrandt’s idea of no “true rotation” and compare with the Blair principle mentioned previously). With right compression and left side-slip, the occiput moves anterior and inferior on the right, as a general rule. Practically, some turning of the supine patient’s face to the right as a prestress but again, the left thrust must be given without rotation.

3. The Occipitoatlantal Rocker alignment:

The objective here is to align the atlas and the occipital condyles into a perfectly normal functional rocker union. In practice, if you have determined that there is some degree of lateral flexion, rotation or translation present, a “mirror-image” position could be used as the starting point of this procedure. Also, in practice, the usage of the stair step technique following the occipitoatlantal condyle rocker is quite a good approach.

The technique:

Patient lies supine with skull on a small pillow. Doctor is seated at the head of the table. Right hand is used to right skull and left hand to left skull. Index and middle fingers contact the mastoids with the balance of the hand acting to support the skull.

Using the fingers as the medium of leverage, the skull is now bent backwards onto the fingers. The skull is now rocked forward using the fingers as the fulcrum. Normally, this movement should be easily made and should meet no resistance. When resistance is met repeat until resistance is overcome. The thing not to do with the condyle rocker is lift the patient's head off the small pillow you are using or off the headpiece as this makes the condyle rock difficult as the patient has to use much energy and so do you. The objective here is to produce an easy controlled movement specifically at this joint surface which is as small as the nail on your little finger. When the skull is raised from the pillow, the cervical occipital muscles become defensive and a true rocker movement is impossible.

This movement is a true pump-like motion in which the medulla spinalis is actually stretched and relaxed and this movement reflects into the membranes of the intracranial vault.

Out SOT seminar attendees will note that this technique as taught in category I protocol has the cranial technique "disclaimer" after description i.e. "discontinue technique if patient shows nausea, blanching or dizziness." The rocker movement was, in fact, developed as part of the DeJarnette cranial technique.

In doing this particular adjustment, the doctor will have a tendency to force the adjustment. This should never be done. The object here is a gentle re-establishment of one of the most normal movements in the human body and one that should be performed many times a day with total ease.

An addition to this technique offered in our seminars is the "patient active" component. You instruct the patient to first pull head forward and then back without raising their head from your hands. You may find this useful on the patient with an extremely tight and non-functioning upper cervical area. Likewise, the stairstep technique for the lower cervical spine, which may be used following condyle rocker, sometimes proves a challenge for the doctor with small hands, the patient with a big head or the patient who "won't let go" enough for the smooth glide required. Getting the patient to actively guide their neck through flexion and extension may be all you wish to achieve for several visits.

Conclusion:

This article is the last of the Category IV to VIII series. DeJarnette's use of the extra categories in 1970 made us ask the question as to why he would consider these five subjects so important. We hope we have answered that question for you, our "Expression" readers, as we have delved into SOT manual of past and present and added conceptual framework from other Chiropractic texts.

Our objective in writing has been to focus on the practical, day to day clinic aspects of SOT. We are motivated by the thoughts of American physicist, P.W. Bridgeman who said, "A statement may be said to have meaning only if it can be translated into operations to test it. If a table is said to be 5 feet long, a person can measure it with a ruler. But if one says, 'Man is born free, but everywhere he is in chains,' what operations could verify this assertion?"

"Observe. Test. Experience. Conclude." Is the catchcry of SOT.

As a reader of the "Expression" series you will have noticed that we have used the 1970 notes as a base and have included reference to early and later editions which we have found to be of interest in the tracking of the development of SOT. We were fortunate enough to be around in the 1980s when there was a serious sale of some of DeJarnette's earlier SOT manuals. SOTO A/Asia had acquired multiple copies of SOT of the 1950s, 1960s and 1970 (we will dedicate a future Expression article to the DeJarnette written catalogue) and they offer sometimes a different "take" on the subject matter, we have found some more theoretical, others more practical but always enjoyable to read.

DeJarnette himself summarized the SOT learning experience in a January 1985 bulletin:

“To recognise this long search for knowledge all one has to do today is read every book the major has written and there are over 100 of them. They are the documentary and the record of this step-by-step development of Sacro Occipital Technique. They are interesting and they are informative, but today you can sum it all up in three available books by the major:

- “1. Sacro Occipital Technic 1984
- “2. Cranial Technic 1979-80
- “3. CMRT 1966.”

There is a fourth volume which we have suggested on several occasions in this article series – DeJarnette’s 1981 “The Philosophy, Art and Science of SOT” which adds the why and wherefore and is a book you will want to read over and over. Averil, our coordinator, has multiple copies of these four works. Soto A/Asia has kept the cost of these at a very affordable price to allow you to own your own copy & we urge you to call Averil if you need to complete your library.

Until next time,
We remain,

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