

The Cervical Syndrome As a Cause of Migraine

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"Dr. Ruth Jackson was the first woman physician to be elected to membership in the American Academy of Orthopedic Surgery and to be certified by the American Board of Orthopedic Surgery."

THIS AUTHOR NOTES:

At least half of patients suffering from cervical syndrome causing shoulder disability will also complain of headache as one of their principle symptoms.

The cervical syndrome is caused by "cervical nerve root irritation."

There is a relationship between the cervical syndrome, cervical nerve root irritation, and the autonomic nervous system.

"The cervical nerve roots are more vulnerable to pressure or irritation from ruptured discs, hemorrhage, inflammatory processes of the capsules, spurs, and abnormal motion of the joints due to relaxation or tearing of the capsular and ligamentous structures." **[NOTE: "abnormal motion of the joints"]**

Sympathetic nerves that originate at the T1 and T2 levels ascend into the cervical spine becoming the cervical sympathetic trunk, with its inferior, middle, and superior ganglia.

"From the superior cervical ganglia, grey rami communicantes [post-ganglionic sympathetic efferents] pass from the ganglia to the anterior rami of the upper four cervical nerves."

"Other postganglionic [sympathetic] fibers travel via the internal carotid and ophthalmic arteries to join the orbit and supply the dilator muscle of the pupil and smooth muscles of the upper eyelid, the back of the orbit, and the blood vessels of the eyeball."

"Irritation of the cervical nerve roots before they divide into anterior and posterior primary rami may occur as a result of any mechanical derangement in or about the intervertebral foramina. The most common cause of irritation is abnormal motion or subluxation of the joints due to relaxation of the capsular and ligamentous structures following trauma."

Following whiplash trauma, as time passes, "abnormal motion or subluxations of the articular processes, will cause irritation of one or more nerve roots."

"Rupture of one or two intervertebral discs may occur then or later as a result of a trivial injury such as a sudden motion of the neck."

"Any unguarded motion or prolonged relaxation of the neck in one position may allow a subluxation to occur," which may cause cervical nerve root irritation.

In a patient with a "crick in the neck" the "crick is a result of cervical nerve root irritation from subluxation, pressure from a ruptured disc, or irritation from an inflammatory process in the capsules."

In reviewing the history of 200 patients with neck symptoms, "the accidents had occurred from a few hours to thirty years before the patients were seen in our clinic, and symptoms had been present from the time of the accident to many years after the injury."

64% of the patients with neck symptoms were women, and age ranged from 7 to 70 years.

If the C1-C2-C3 nerve roots are involved, typical symptoms include:

- 1) Neck pain
- 2) Limitation of neck motion
- 3) Headache, which usually "starts at the back of the neck or base of the skull and then involves one or both sides of the head, and pain in the mastoid region or in the ears"
- 4) Blurring of the vision (found in 20% of patients)
- 5) Dizziness and nausea
- 6) Numbness of the sides of the neck
- 7) Tightness of the neck muscles
- 8) Pain in the supraclavicular region

"If C4 is involved there may be shortness of breath, palpitations, anterior chest pain and pain and muscle spasm in the muscles supplied by C4."

"When the lower nerve roots are involved, the symptoms are commensurate with the segmental character of the nerve roots which are irritated." These patients often have numbness or tingling of the fingers when they awaken.

"In all instances the symptoms are brought on or aggravated by certain motions of the neck or by maintaining certain positions over long periods of time," including:

- Sewing
- Reading
- Writing
- Cooking
- Driving
- Poor sleeping postures

"There is always tenderness to deep pressure over the vertebrae, usually just lateral to the spinous process of the side of the nerve root irritation."

[Important] "If the irritation is above the fourth nerve root there may be tender areas over the occiput and the mastoid. If the fourth nerve root is involved, there may be tender areas in the ridge of the trapezius and/or in the sterno-mastoid muscles."

5% of patients will have a dilation of the pupil on the side of nerve root irritation.

"The most constant finding in all of our cases was the presence of myalgic areas in the upper or lower cervical portion of the rhomboid muscles which is indicative of fifth nerve root irritation."

"Often there seems to be localized fibrosis of the muscle. Irritation causes spasm which if allowed to persist causes ischemia with eventual formation of localized fibrosis." **[Important, Fibrosis of Repair]**

Irritation of the fourth nerve root may cause referred pain to the diaphragm, the pericardium, and shoulder.

"X-rays of the cervical spine are of real diagnostic aid in cervical nerve root irritation." Dr. Jackson recommends a Davis series of x-rays be taken in all cervical trauma cases, and emphasizes the importance of maximum flexion and maximum extension views.

"In 70% of our cases there was obliteration of the curve and in 20% of these a segmental reversal of the [cervical lordotic] curve."

Dr. Jackson calls abnormal forward or backward slipping of a vertebral segment on flexion or extension a "subluxation," stating "90% of our patients had forward subluxations and 56% had backward subluxations."

96% of patients with cervical syndrome headaches will show subluxations at more than one level, and in 77% the subluxation was of C2 on C3, irritating the C3 nerve root. "This indicates that the irritation of the third cervical nerve root must have been responsible for the greatest percentage of headache."

Dr. Jackson believes that the blurring of the vision (and ipsilateral pupil dilation, when present) seen in many cervical syndrome/headache patients is caused by irritation of the superior sympathetic ganglion caused by cervical muscle spasm.

Dr. Jackson maintains that "cervical nerve root irritation (C3 usually) is an etiological factor in migraine."

Dr. Jackson recommends the use of a cervical contour pillow for rest and healing. She states "the contour pillow fits the natural curve of the neck. We then made x-ray films to prove that the contour pillow maintains the neck in a straight position while the conventional pillow causes slight flexion of the neck." "This pillow has been our greatest adjunct in the treatment of cervical nerve root irritation."

CONCLUSION

"The upper cervical nerve roots supply the major portion of the scalp, the middle and posterior scalenes, and the sternomastoid muscles. Spasm of these muscles which surround the superior sympathetic ganglia may, and do, cause irritation of the ganglia or the postganglionic fibers. Therefore, irritation of the upper cervical nerve roots (C2 to C4) with or without the associated irritation of the cervical sympathetics can certainly cause symptoms of migraine."

KEY POINTS FROM DAN MURPHY

- 1) "Dr. Ruth Jackson was the first woman physician to be elected to membership in the American Academy of Orthopedic Surgery and to be certified by the American Board of Orthopedic Surgery."
- 2) At least half of patients suffering from cervical syndrome causing shoulder disability will also complain of headache as one of their principle symptoms.
- 3) The cervical syndrome is caused by "cervical nerve root irritation."
- 4) There is a relationship between the cervical syndrome, cervical nerve root irritation, and the sympathetic nervous system. It is this sympathetic nervous system involvement that is responsible for headaches, including migraine.
- 5) "The cervical nerve roots are more vulnerable to pressure or irritation from ruptured discs, hemorrhage, inflammatory processes of the capsules, spurs, and abnormal motion of the joints due to relaxation or tearing of the capsular and ligamentous structures." **[NOTE: "abnormal motion of the joints"]**
- 6) Sympathetic nerves that originate at the T1 and T2 levels ascend into the cervical spine becoming the cervical sympathetic trunk, with its inferior, middle, and superior ganglia.
- 7) "From the superior cervical ganglia, grey rami communicantes [post-ganglionic sympathetic efferents] pass from the ganglia to the anterior rami of the upper four cervical nerves."
- 8) "Other postganglionic [sympathetic] fibers travel via the internal carotid and ophthalmic arteries to join the orbit and supply the dilator muscle of the pupil and smooth muscles of the upper eyelid, the back of the orbit, and the blood vessels of the eyeball."

- 9) "Irritation of the cervical nerve roots before they divide into anterior and posterior primary rami may occur as a result of any mechanical derangement in or about the intervertebral foramina. The most common cause of irritation is abnormal motion or subluxation of the joints due to relaxation of the capsular and ligamentous structures following trauma."
- 10) Following whiplash trauma, as time passes, "abnormal motion or subluxations of the articular processes, will cause irritation of one or more nerve roots."
- 11) "Any unguarded motion or prolonged relaxation of the neck in one position may allow a subluxation to occur," which may cause cervical nerve root irritation.
- 12) In a patient with a "crick in the neck" the "crick is a result of cervical nerve root irritation from subluxation, pressure from a ruptured disc, or irritation from an inflammatory process in the capsules."
- 13) Cervical trauma can cause chronic pain syndrome, including pain decades later.
- 14) 64% of the patients with neck symptoms were women, and age ranged from 7 to 70 years.
- 15) If the C1-C2-C3 nerve roots are involved, typical symptoms include:
- A) Neck pain
 - B) Limitation of neck motion
 - C) Headache, which usually "starts at the back of the neck or base of the skull and then involves one or both sides of the head, and pain in the mastoid region or in the ears"
 - D) Blurring of the vision (found in 20% of patients)
 - E) Dizziness and nausea
 - F) Numbness of the sides of the neck
 - G) Tightness of the neck muscles
 - H) Pain in the supraclavicular region
- 16) "If C4 is involved there may be shortness of breath, palpitations, anterior chest pain and pain and muscle spasm in the muscles supplied by C4."
- 17) "When the lower nerve roots are involved, the symptoms are commensurate with the segmental character of the nerve roots which are irritated." These patients often have numbness or tingling of the fingers when they awaken.
- 18) "There is always tenderness to deep pressure over the vertebrae, usually just lateral to the spinous process of the side of the nerve root irritation." **[Important]** "If the irritation is above the fourth nerve root there may be tender areas over the occiput and the mastoid. If the fourth nerve root is involved, there may be tender areas in the ridge of the trapezius and/or in the sternomastoid muscles."

- 19) "The most constant finding in all of our cases was the presence of myalgic areas in the upper or lower cervical portion of the rhomboid muscles which is indicative of fifth nerve root irritation."
- 20) "Often there seems to be localized fibrosis of the muscle. Irritation causes spasm which if allowed to persist causes ischemia with eventual formation of localized fibrosis." **[Important, Fibrosis of Repair]**
- 21) Irritation of the fourth nerve root may cause referred pain to the diaphragm, the pericardium, and shoulder.
- 22) "X-rays of the cervical spine are of real diagnostic aid in cervical nerve root irritation." A Davis series of x-rays must be taken in all cervical trauma cases, and emphasize the importance of maximum flexion and maximum extension views.
- 23) "In 70% of cases there is obliteration of the curve and in 20% of these a segmental reversal of the [cervical lordotic] curve.
- 24) The abnormal forward or backward slipping of a vertebral segment on flexion or extension is called a "subluxation." 90% of patients have forward subluxations and 56% have backward subluxations.
- 25) 96% of patients with cervical syndrome headaches will show subluxations at more than one level, and in 77% the subluxation was of C2 on C3, irritating the C3 nerve root. "This indicates that the irritation of the third cervical nerve root must have been responsible for the greatest percentage of headache."
- 26) Dr. Jackson believes that the blurring of the vision (and ipsilateral pupil dilation, when present) seen in many cervical syndrome/headache patients is caused by irritation of the superior sympathetic ganglion caused by cervical muscle spasm.
- 27) "Cervical nerve root irritation (C3 usually) is an etiological factor in migraine."
- 28) Injured patients should use a cervical contour pillow for rest and healing. "This pillow has been our greatest adjunct in the treatment of cervical nerve root irritation."
- 29) "The upper cervical nerve roots supply the major portion of the scalp, the middle and posterior scalenes, and the sternomastoid muscles. Spasm of these muscles which surround the superior sympathetic ganglia may, and do, cause irritation of the ganglia or the postganglionic fibers. Therefore, irritation of the upper cervical nerve roots (C2 to C4) with or without the associated irritation of the cervical sympathetics can certainly cause symptoms of migraine."

NOTICE HOW OFTEN DR. JACKSON USES THE CONCEPT AND WORD
"SUBLUXATION" AND NERVE IRRITATION