

Corinthian Diagnostic Radiology

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[Patient Name Removed]

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Re: [Patient Name Removed]

Date of loss June 23, 2014

File #: JHF- 0115

Review of radiology studies: Cervical X-Ray 7/23/14, Cervical MRI 7/23/14, post-op cervical CT 7/13/15 and their reports.

Mr. Neal Forman, Esq:

1. MEDICAL ARTS MRI radiology report typed July 25,2014 of the July 23,2014 MRI:

In the body of the report: "At C5/6, there is a right foraminal disc\osteophyte with marked right foraminal compromise."

In the CONCLUSION: "Degenerative changes at C5/6 where there is a right foraminal disc herniation with associated osteophyte resulting in marked right foraminal compromise." Report of neuroradiologist [Name Removed], 7/25/14 Medical Arts Radiology

This "associated osteophyte" was also mentioned by [Name Removed], neuroradiologist and [Name Removed], orthopedic surgeon to indicate that the herniation is old and therefore pre-existing.

1A. "foraminal disc\osteophyte" usually implies a doubt about whether what is seen on the MRI is an osteophyte or disc herniation. If a herniation, usually an old dried-out one. In the conclusion, Dr. [Name Removed] states "foraminal herniation with associated osteophyte." But there is no posterior or lateral osteophyte visible at C5-6 either in the X-ray or MRI of 7/23/14, figures 1, 3, 4 and 8, obtained prior to his surgery. There are osteophytes anteriorly at C4 and C5, figures 1 and 2. A posterior osteophyte would have been visible on both the lateral X-Ray and the MRI, figures 1, 3 and 8.

2. Dr. [Name Removed] states, because the herniation is bounded by osteophytes, it indicates that the herniation is old. Dr. [Name Removed] also reports this.

2A. The right C5-6 posterior herniation extending into the proximal foramen and compromising the right C6 nerve does not have an osteophyte either superior or inferior to the herniation. The osteophytes present on either study is the anterior bridging osteophytes at C4-5 and the very small posterior osteophytes at C2-3, figures 1 and 2.

When disk material first herniates, it has a similar intensity to the normal disc on an MRI. As the disc considerably ages, it loses water and its intensity becomes darker on MRI than the normal looking disc, figure 9a. [Patient Name Removed] right C5-6 herniation has a similar intensity to the remaining disc material, figure 9b, between the vertebrae indicating that it is acute to subacute, not old, chronic. It takes many months to years for the disc to dry-out. This herniation at C5-6 is less than a few months old and similar in intensity to the small posterior midline herniation at C4-5, figures 3, 8-11.

3. The force of the rear end collision was not sufficient to cause a herniation.

3A. Considerable force is not necessarily needed to cause the material inside the disc to herniate beyond the annulus fibrosus (“belt”) that surrounds and contains the cushioning soft disc material between the vertebrae. An impulse force applied to the disk can cause it to herniate through the annulus fibrosus (“belt”) and compress a nerve. If the rupture was posterior right or left, it may cause a radiculopathy, nerve compression, and in [Patient Name Removed]'s case, a right C6 radiculopathy and neck pain. If the herniation was anterior, far lateral or posterior midline, it would not cause a radiculopathy not being near a main nerve, it would not compress the nerve. These types of herniations would most likely cause just neck pain, because there are very small pain nerve fibers in the annulus fibrosus.



Figure 1

PRE-OP LATERAL X-RAY, July 23, 2014: the osteophyte, bone spur, is anterior at C4-5, there is no osteophyte at C5-6 either anteriorly, or more importantly, posteriorly.

MEDICAL ARTS MRI radiology report typed July 25,2014 of the July 23,2014 MRI:

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In the CONCLUSION: “Degenerative changes at C5/6 where there is a right foraminal disc herniation with associated osteophyte resulting in marked right foraminal compromise.” [Name Removed], radiologist

“foraminal disc\osteophyte” usually indicates either\or, or both. “Degenerative changes” do describe an acute or subacute herniation but osteophytes, chronic disc dehydration, hypertrophy, etc. There is no posterior osteophyte visible at C5-6. There are osteophytes anteriorly at C4-5, figures 1 and 2.



Figure 2

POST-OP (AFTER SURGERY) LATERAL REFORMATTED CT, July 13, 2015: CT sagittal view of the C4-5 anterior osteophyte. If there was a C5-6 posterior or lateral osteophyte (and there was not) it may or would have been resected at surgery, explaining why it would not be seen on this image.

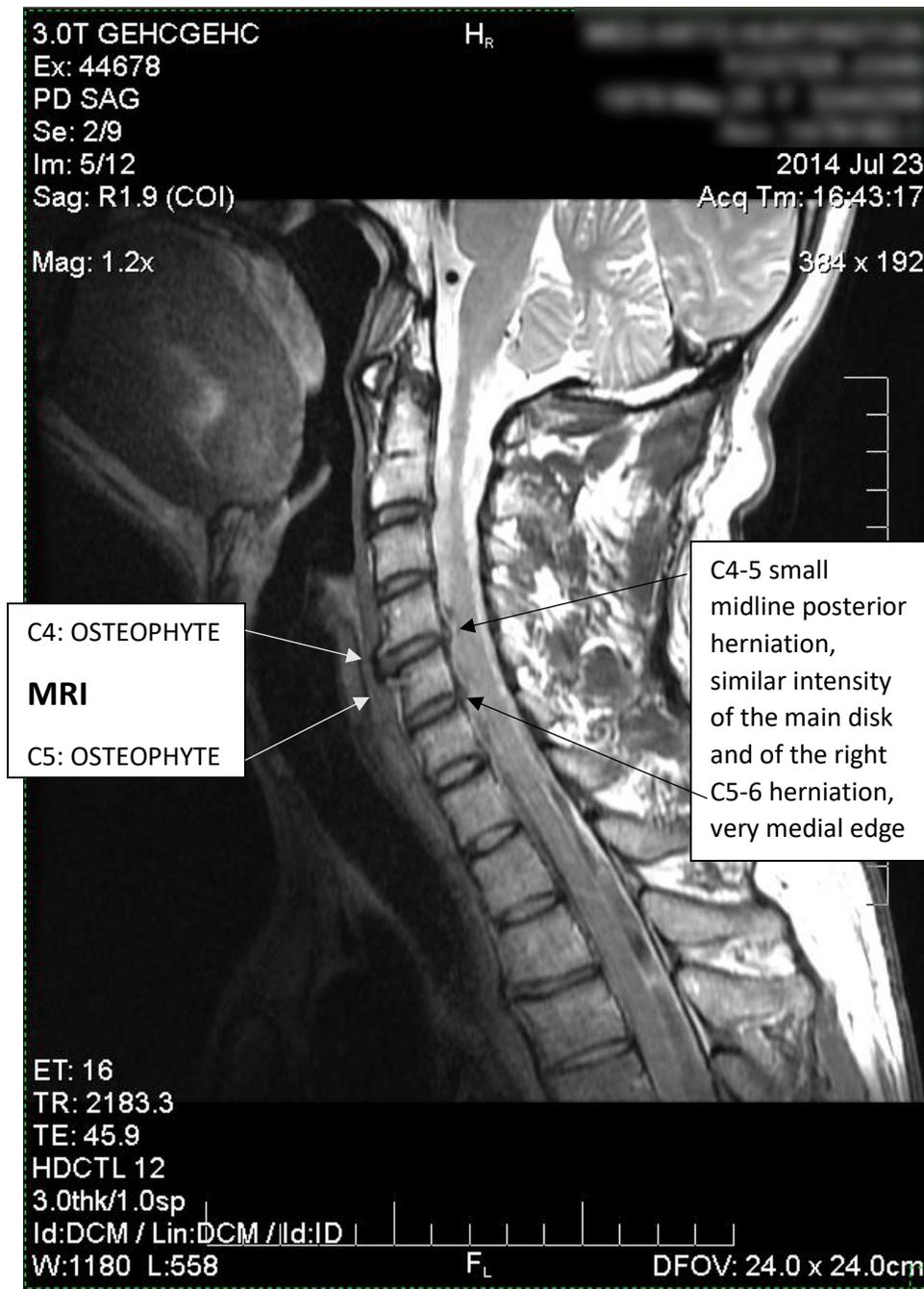


Figure 3

PRE-OP MRI LATERAL VIEW OF OSTEOPHYTE, July 23, 2014, same as the X-Ray: this is what a mature, chronic osteophyte on MRI looks like, it has marrow inside and dark cortical bone outside. Osteophytes at C4-5 are anterior. There are no osteophytes at C5-6 either anterior or posterior. The small posterior C4-5 herniation has the same intensity as the main disc and the right C5-6 herniation, black arrows, and in figure 8.



Figure 4

PRE-OP UNCOVERTEBRAL JOINT (UV-J) July 23, 2014, NORMAL: there are no osteophytes laterally at C5-6 at the uncovertebral joint. Uncus, (“unco”) means, “hook”.

SOMATOM Definition AS
Ex: 72125P
COR BONE CURVED
Se: 507/9
Im: 8/20
: 0.0

2015 Jul 13
Acq Tm: 15:07:57.006000

Mag: 1.2x

512 x 512

Spin: 0
Tilt: -4

<L>

C5: top arrow

CT COR uv-j

C6: bottom arrow



0.0 kV
0.0 mA
Tilt: 0.0
0.0 s

Lin:DCM / Lin:DCM / Id:ID
WINDOW1 W:2890 L:360

DFOV: 0.0 x 0.0cm

Figure 5

POST-P CT UNCOVERTEBRAL JOINT (UV-J) C5-6, July 13,2015, NOT NORMAL, SMALL RIGHT OSTEOPHYTES, ARROWS, SEE ALSO FIGURE 6, NOT PRESENT PRE-OP.

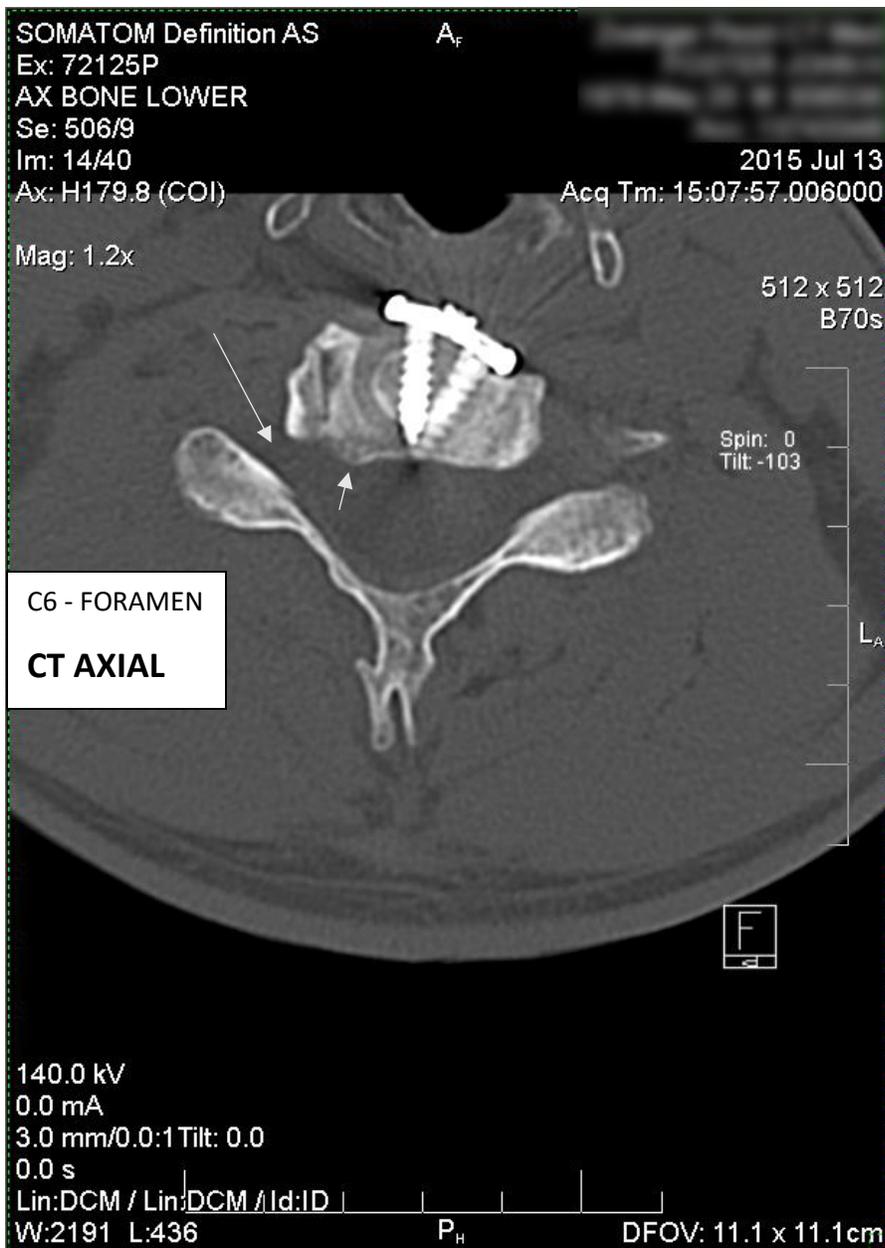


Figure 6

POST-OP AXIAL CT July 13, 2015: 1 year later, bony foramen (“window”) is clear, arrow. There is now a small and what “appears” to be an osteophyte right posterior C6, short arrow. It is just the remains of normal bone excavated during surgery and appearing to project posteriorly, see sagittal CT that follows, figure 7. This was not present on the pre-op July 23, 2014 X-Ray or MRI, figures 1 and 3.



Figure 7

POST-OP CT SAGITTAL: it is this normal residual bone, arrow, after excavating part of the vertebra to make room for the fusion element, bone plug, between the C5 and C6 vertebra that seems to project beyond the vertebra posteriorly only because the axial slice orientation traverses the bone plug then it, arrow resulting in a false appearance of an osteophyte.



Figure 8

RIGHT SAGITTAL MRI, pre-op July 23 2014: There are no “covering” osteophytes to “support the herniation” above or below it. The signal of the herniation is similar to that of normal disk signal. This signal is due to water contained in the herniation. Old herniations dehydrate, loss water and become darker. The MRI signal comes from the hydrogen in water and tissues. Dehydration of a herniated disk takes many months to years to occur.



Figure 9 a, b: the images brightness level has been increased and contrast level has been reduced to better show differences in intensity. Both images are the same in brightness and contrast.

Fig. 9a: The anterior herniation at C4-5 is very dark because it is chronic, old, dehydrated, white arrows.

Fig. 9b: C5-6 the right posterior and foraminal herniation is bright and similar in intensity to normal disc material in between the vertebra indicating it is acute to subacute, recent, younger, black arrow.



Figure 10

PRE-OP FURTHER RIGHT SAGITTAL MRI AT THE LEVEL OF THE FORAMEN, July 23, 2014: the herniation compresses the right C6 nerve exiting into the foramen. There is no osteophyte present in the foramen.

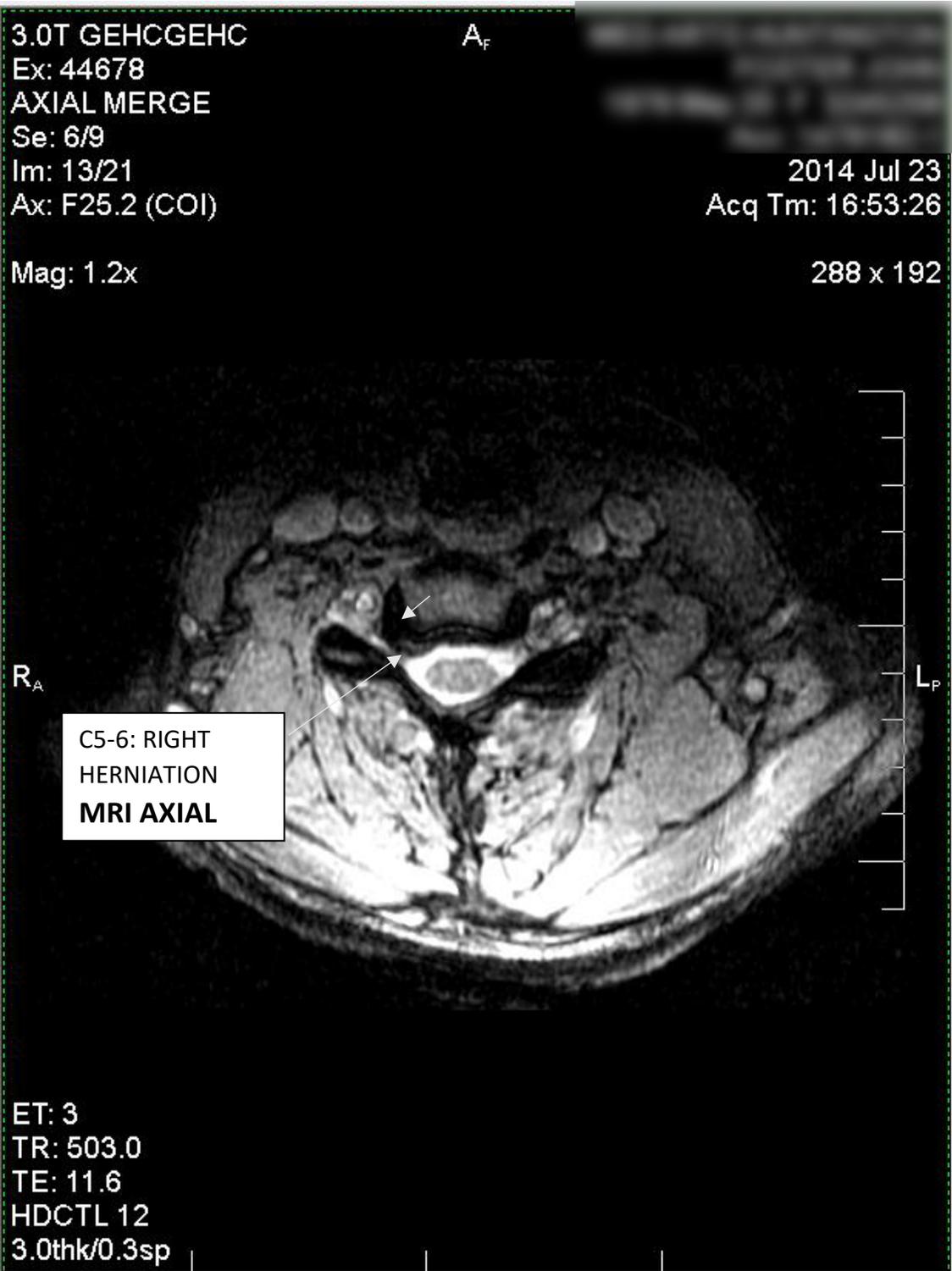


Figure 11

PRE-OP, AXIAL MRI SEQUENCE, this particular imaging sequence reduces the intensity of all tissues, July 23,2014: also shows increase signal in the herniated disk, arrow, indicating that it is not old, better seen in figure 9b.

The area depicted by the short arrow would suggest that there is bone thickening, an osteophyte, at the uncovertebral joint. But an osteophyte was not present at this location on the X-Ray, figure 4. Because the slice thickness of the image is 3mm it can include tissue from above or below it, called "volume averaging". In this case at C6, the bony cortex of the lateral mass/pedicle from below it, which is black. If the anatomy is slightly tilted, the image slice intersects anatomy below and "volume averaging" partially incorporates it onto the anatomy above and adds it to the normal uncovertebral joint thickness. This gives the false appearance of thickening, an osteophyte, of the uncovertebral joint. Even if this was an osteophyte, and it is not, it is lateral and in the mid to distal portion of the foramen and away from and not associated to the recent right posterior herniated disk. It is definitely not above or below the right C5-6 herniated disk fragment as indicated by Dr. [Name Removed] to "support the herniation".