A Decapitated Human Skull from Medieval Kamakura

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Abstract The present study reports on the examination of a decapitated human male skull with four upper cervical vertebrae and the hyoid bone, dating to the early Muromachi period (late 14th century), from Kamakura. The decapitation may have been the result of a sharp cut from the right rear. The cut runs horizontally into the second cervical vertebra and stops in the bone, after having severed both the spinal cord and the right vertebral artery. Superficial injuries to the skull were probably not the primary cause of death. The head was separated from the body post mortem, probably as a result of an additional cut noted in the fourth cervical vertebra. It is suggested that the traditional Japanese method of decapitation in former times may be characterized by a cut halfway through the neck, and this method of decapitation can be traced back to the early Muromachi period.

Key Words Decapitation, Cut injury, Cervical vertebrae, Medieval Muromachi period, Japanese tradition

Material

The decapitated skull reported here (no. 1043) was excavated from location D-197 of the Yuigahama Medieval Cemetery, Kamakura, in 1991, under the supervision of Mr. Hiroshi HARA. Two additional decapitated human, male, skulls from another site in Kamakura have been previously reported by MORIMOTO (1987). This site dates to the early Muromachi, or Namboku-cho period (late 14th century). The skull with four upper cervical vertebrae and the hyoid bone, were the only bones recovered from this individual. The cervical vertebrae are not present in most decapitation specimens discovered. The skull with the injured vertebrae, presented in this report, are interesting and valuable discoveries. They may be useful in contributing to an explanation of the origin of the traditional Japanese method of decapitation.

Observations

The excavated bones were in good condition with a well preserved internal architecture. There was no closure of the coronal, lambdoid or sagittal sutures on both external and internal surfaces of the cranial vault, although upper and lower third molars, with slight wear, could be seen on both sides. Therefore the male of this skull would have been in his early twenties at the time of death. The paleopathological observations concerning the method of decapitation obtained are given in the following description.

A dozen injuries, probably resulting from a...
Japanese sword with a keen edge, were found in both the skull and the cervical vertebrae. The skull had six injuries. An injury to the frontal squama on the right side was 45mm in length, running in an oblique direction from the right rear to the left front (a in Fig. 1). The injury took the form of superficial incisions, having an inclined cut surface from the external table to the diploe of the squama, accompanied with a secondary loss of bone opposed to the cut surface. Another injury to the anterior border of the lateral wall of the right orbit grazed the bone. The area involved is from the right zygomatic process of the frontal bone to the frontal process of the right zygomatic, although the cut surface was divided into two small facets by a faint transverse ridge (b in Fig. 1). One more injury to the right parietal bone ran in an almost sagittal direction below, and parallel to, the right temporal line (c in Fig. 2). The entire length of this injury could not be determined, because most of the cut surface and its neighboring area had been broken and lost. It was, however, conceivable that the cutting by the sword took the form of a kind of
Fig. 2. The cranial vault, viewed from right-inferior-rear. Note the injuries to both the right parietal (c) and the occipital (d) bones. The former took the form of a kind of gash, tangentially reaching the cranial cavity to a slight degree, whereas the latter cut off the right inferior nuchal line, causing a break of the neighboring nuchal plane.

gash, tangentially reaching the cranial cavity to a slight degree.

All the above three injuries to the skull showed the clear-cut unhealed nature of the wound, so that they would have been made just before death. Because the injuries failed to reach the interior of the skull, they could not be regarded as the primary cause of death. Moreover, there were three other injuries to the skull; one to the occipital bone, and two to the mandible. The injury to the occipital bone cut off the right inferior nuchal line in a slightly inclined plane from right cranially to left caudally, causing a break of the neighboring nuchal plane, although the sword did not enter into the cranial cavity (d in Fig. 2). It was uncertain whether the occipital bone received the injury during life or after death. The two injuries to the mandible were a pair of upper and lower transverse cuts from the right rear on the posterior border of the right mandibular ramus. The upper transverse cut ran somewhat obliquely from the lower rear upward toward the front (e in Fig. 3), whereas the lower injury passed in a nearly horizontal direction (f in Fig. 3). These injuries corresponded to the two cut surfaces in the second cervical vertebra or axis (j and h in Fig. 5) mentioned below.

The upper four cervical vertebrae had six injuries due to five cuts with the sword. The first cervical vertebra, or atlas, was cut horizontally from behind. This chipped off the lower border of the posterior part of the vertebral arch of this bone (g in Fig. 4). The cut surface in the atlas corresponded to the most superior cut in the axis as mentioned next. The axis was cut horizontally from the right rear three times by the sword, so
that the bone had three cut surfaces. These cut surfaces were laid at three different levels in this bone. The most superior cut surface was located on the posterior portion of the base of the odontoid process or dens (h in Fig. 5), and the second superior cut surface was running through both the upper portion of the vertebral arch and the posterior half of the right superior articular process about half a centimeter below the level of the most superior cut (i in Fig. 5).

Both the most superior and second superior cut surfaces stopped anteriorly at the central parts of the dens and vertebral body, so that there was a loss of the dens and vertebral body between the two cut surfaces. Because the plane of the most superior cut surface in the axis corresponded to that of the above-mentioned lower cut on the posterior border of the right mandibular ramus (f in Fig. 3), it seemed that the cutting sword was stopped not only by the dens, but also by the right mandibular ramus. The most inferior cut surface in the axis was running through the spinous process and stopped in the vertebral arch of this bone, resulting in chipping off the bone.

Fig. 3. The right mandibular ramus, viewed from the right. The injuries (e) and (f) in this bone respectively corresponded to those to the axis (i) and (h), which are shown in Fig. 5.
Fig. 4. The atlas, viewed from below. Note that the injury to this bone (g) corresponded to that to the axis (h) as shown in Fig. 5.

Fig. 5. The axis, viewed from above. Note the three injuries (h), (i) and (j) to this bone at the different levels. For explanation see text.
Fig. 6. The third cervical vertebra, viewed from the rear. Note the oblique injury (k) to the vertebral body through the right inferior articular processes and vertebral arch.

Fig. 7. The fourth cervical vertebra, viewed from below. Note the injury to this bone (l), which was stopped at the vertebral body after passing through the spinous and right inferior articular processes.
above the cut surface (j in Fig. 5).

The most inferior cut surface was in a slightly inclined direction from the right rear to the left above. Because it corresponded to the upper cut on the posterior border of the right mandibular ramus (e in Fig. 3), it was probable that the cutting was also stopped by both the axis and the mandible.

The third cervical vertebra was cut from the right rear (k in Fig. 6). The cut surface passed obliquely from the right below to the left above, parallel to the lowest cut surface in the axis. It ran into both the vertebral arch and the body through the spinous and right inferior articular processes of this bone, and came to a stop at the left pedicle of the vertebral arch. As a result, the spinous and right inferior articular processes and their neighboring area of this bone were cut off and lost.

Finally, the fourth cervical vertebra was cut horizontally from the right rear, the cut surface passing from the spinous and right inferior articular processes to stop on a straight line connecting the left inferior articular process with the left quarter of the vertebral body (l in Fig. 7). The spinous and left inferior articular processes of this bone were thus cut off and lost. No injury was, however, found in the hyoid bone.

**Discussion and Conclusion**

Considering the sword injuries to both the skull and the cervical vertebrae, the human male

![Image](image_url)

**Fig. 8.** The upper four cervical vertebrae articulated, viewed from behind. Note the injuries to the atlas (g), to the axis (h), (i) and (j), and to the third (k) and fourth (l) cervical vertebrae, due to five cuts at various levels.
examined in this report died as a direct result of decapitation. The injuries to the frontal squama, the lateral wall of the right orbit, and the right parietal and occipital bones of the skull, as mentioned above, were probably not the primary cause of death. Since there were found five cut surfaces in the articulated cervical vertebrae of this male, it is difficult to determine the decisive injury from which he died when decapitated.

Of the five cuts, the lowest in the axis (j in Fig. 8) and the cut in the third cervical vertebra (k in Fig. 8) are to be excluded for two reasons. The first reason is that the cuts followed an oblique line running from the right rear to the left superior direction so that these cuts could not have resulted in a decapitation. The second reason is that the cut in the axis was too superficial to sever the spinal cord. The remaining three cuts in the neck can be divided into two, two upper and one lower. The upper two cuts (g + h and i in Fig. 8) were concentrated on the atlas and the axis, while the lower cut (l in Figs. 8 and 9) passed into the fourth cervical vertebra. As previously mentioned by KAWAGOE (1965) and MORIMOTO (1981), the sword at the time of decapitation approached from behind and sometimes missed the mark and cut into the occipital bone. This indicates that the junction of the skull and the vertebral column was the target of the sword for decapitation. It is, thus, natural to suppose that one of the two cuts in the axis of this male had a possibility of providing the fatal injury during decapitation.

Either of these two cuts could have taken his life, because it ran horizontally to reach a depth sufficient to sever both the spinal cord and the right vertebral artery. The second superior cut in the axis, as well as the cuts in the third and fourth cervical vertebrae, were on the other hand possibly made by the sword when the head was

Fig. 9. The skull and upper four cervical vertebrae articulated, viewed from front. Note that the cut to the fourth cervical vertebra (l) was stopped after cutting into the bone.
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separated from the body after death. This is based on three reasons as follows; 1) the injuries to the atlas and dens were too high to separate the head from the body after death, and the mandible obstructed the cutting; 2) the injury to the third cervical vertebra ran in a direction difficult for decapitation, running obliquely from the right rear to the left above, almost parallel to the lowest cut in the axis as mentioned above; and 3) only the skull with the upper four cervical vertebrae and the hyoid bone remained, suggesting that the effective and final separation of the head was done by a cut into the fourth cervical vertebra.

The decapitated male may have been a seriously wounded warrior, or samurai, who had given up all hope of living, and was then assisted in committing suicide, either by his wish, or an order as a result of an unavoidable circumstance. In Japan at that time, the execution of a samurai was considered a disgrace, thus suicide by sword was viewed as an honorable way of dying. After the identification of the head, which had been separated and taken away from the body, it was buried at the Yuigahama Cemetery in Kamakura. At any rate, the observations obtained clearly show that the sword for decapitation in the medieval Kamakura passed deep into the cervical vertebral column from the right rear, and yet came to a full stop within the bone after severing the spinal cord and the right vertebral artery, putting him to death.

A Japanese tradition in the feudal Edo period was that the anterior skin of the neck should be left intact at the time of decapitation. The present material, added to the decapitated skulls described previously by MORIMOTO (1987), reveals that the halfway-cut method of decapitation for man was adopted not only in the more recent Edo era, but also in the early medieval Muromachi or Nambokucho period of Japan. BROTHWELL (1981) mentioned that decapitation usually resulted in cleanly divided cervical vertebrae, as seen in Iron Age specimens from Sutton Walls. This apparently was not the traditional method of decapitation in Japan of ancient times. It should be, therefore, noted that the traditional Japanese method of decapitation was distinguishable from the ancient European manner, by a halfway-cut from the right rear.

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と右上関関突起後部を切り軸椎体に達して止まる刀剣（i）。軸椎の棘突起を右後方から切って椎弓根で止まる刀剣（j）、第3頚椎の棘突起・右下関関突起・椎弓・椎体を右後方から切って左椎弓根で止まる刀剣（k）。第4頚椎の棘突起・右下関関突起・椎体下部を切り離して椎体の左4分で止まる刀剣（l）、である。

上述のように環椎の刀剣（g）および軸椎の刀剣（h）は右下頚枝後線の刀剣（f）と、また軸椎の刀剣（j）と右下頚枝後線の刀剣（e）と、それぞれ一致する。舌骨に刀剣は見られなかった。

打ち首された時の創傷は環椎・軸椎・右下頚枝に残る刀剣（g+h+f）か、または軸椎の刀剣（i）のいずれかと推測され、これは頭髷・右椎骨動脈を完全に横切し、致命的である。また軸椎・右下頚枝の刀剣（j+e）および第3・4頚椎の刀剣（k）（l）は死後頭部を切り離した際に加えられたものと思われ、本例はたぶん手負いの武士が名を重ねし首を打たれたものであろう。

江戸時代には「打ち首は頭の前皮一枚残して切るのが常法」と言われたが、古い日本の半切りによる打ち首の伝統の起源が南北朝期までさかのぼり得ることを示す好例として、先の2例とともに本例は注目される。

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