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<tr>
<td>Journal</td>
<td>Bulletin of Tokyo Dental College, 50(1): 37-40</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10130/997">http://hdl.handle.net/10130/997</a></td>
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Case Report

Vertical Fracture of Mandibular Condyle Treated with Intra-articular Pumping Therapy: A Case Report

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Received 5 December, 2008/Accepted for publication 16 February, 2009

Abstract

We report a patient with vertical fracture of the mandibular condyle visualized by computed tomography (CT). A 43-year-old woman visited our department the day after the injury occurred. At the initial examination, she experienced pain in the left temporomandibular joint (TMJ) when opening her mouth. Maximum mouth opening distance was 15 mm. Routine radiography showed normal findings, but CT revealed vertical fracture of the left mandibular condyle. Based on clinical findings, conservative therapy consisting of intra-articular pumping therapy and training for mouth opening was initiated. After 10 days, mouth opening distance increased to 36 mm, and pain in the left TMJ disappeared.

Key words: Vertical fracture—Mandibular condyle—Intra-articular pumping therapy—Computed tomography

Introduction

Fracture of the mandibular condyle is very rare among mandibular fractures. Diagnosing not only vertical fracture but also other types of fracture of the mandibular condyle is difficult due to its anatomical characteristics. We encountered a vertical fracture of the mandibular condyle that could be visualized by computed tomography (CT).

Treatment of fracture of the mandibular condyle aims at recovery of the motor function of the jaw. Therefore, training for mouth opening is indispensable. In this case, intra-articular pumping therapy was performed to alleviate discharge of viscous synovial fluid mixed with blood and pain. From the first day of this therapy, it was also possible to commence mouth opening training. Mouth opening was achieved early, with favorable results.

Case

A 43-year-old woman visited our department due to a locked jaw and pain in the left temporomandibular joint (TMJ) on March,
200X. In the afternoon on the day before her visit, she became very drunk, fell, and received a heavy blow to her chin. On the day of the injury, she underwent suturing for laceration of the chin skin at a local surgical hospital. At the first examination at our hospital, she experienced pain in the left TMJ when opening her mouth, and maximum mouth opening distance was 15 mm. There was no deviation of the mandibular midline (Fig. 1), and intercuspation was possible (Fig. 2).

Routine radiography (orthopantomogram and orbito-ramus projection radiogram) on first examination day showed normal findings (Figs. 3 and 4). However, CT performed 5 days after injury revealed vertical fracture of the left mandibular condyle (Fig. 5).

There was no deviation of the mandibular midline, and intercuspation was possible. Therefore, conservative therapy was planned.

On the day after CT, intra-articular pumping therapy was performed (Fig. 6), and training for mouth opening was initiated on the same day. Ten days after the initiation of this therapy, mouth opening distance increased to 36 mm, and the pain in the left TMJ disappeared. Follow-up observation was continued for about 1 month. Since no recurrence of symptoms was observed during this period, medical consultation was discontinued.
Discussion

For the diagnosis of mandibular condyle fracture, radiographic as well as clinical findings are important. However, radiography sometimes does not provide adequate information due to the anatomical characteristics of the fracture area. Vertical fracture of the mandibular condyle is often difficult to diagnose by plain radiography due to its anatomical characteristics. In this case, the deviation of bone fragments was small, and diagnosis was difficult by plain radiography alone.

The widespread use of CT in recent years has allowed detailed observation of the pathologic state of fractures, and some cases of vertical fracture of the mandibular condyle have been reported (1-5). In this case, CT was also very useful in arriving at a diagnosis. The fracture line and the sites of deviated bone fragments could be observed in detail by CT. Honda et al. (5) reported the usefulness of tomography at two different angles and CT when fracture of the mandibular condyle was suspected. Avrahami et al. (1) performed coronal CT for close examination in a patient who did not show a fracture line by plain radiography at the first consultation, but developed TMJ ankylosis during follow-up. Their study noted, that coronal CT should be performed when TMJ fracture is suspected. Therefore, in patients with suspected TMJ fracture and clinical symptoms such as locked jaw and pain in the mandibular condyle, CT is indispensable.

Treatment for fracture of the mandibular articular process aims at the recovery of occlusion and improvement of jaw motor function. Occlusal reduction is easier in vertical fracture of the mandibular condyle such as in this case, than in fracture of the neck of the articular process, since the height of the mandibular ramus is maintained. Therefore, the treatment methods selected should place importance on the recovery of jaw motor function. This case involved a fresh fracture, and conservative therapy was performed with importance being placed on the recovery of jaw motor function. As a result, good jaw motor function was achieved. Cases of vertical fracture of the mandibular condyle that were surgically treated have also been reported. Eguchi et al. (5) performed surgery in a patient with vertical fracture of the mandibular condyle. When small bone fragments were removed, resection of the mandibular condyle was necessary, but they reported that removal of small fragments was the best treatment method. Onizawa et al. (9) removed small bone fragments by inverting the zygomatic arch for an old fracture of the
mandibular condyle. The patient was not able
to open their mouth, so osteoplasty of the
mandibular condyle, articular disc resection,
and scar resection were performed. However,
they also stated that this case could have been
adequately treated by conservative methods if
training for mouth opening had been initiated
early after injury. Therefore, for vertical frac-
ture of the mandibular condyle, the surgical
approach for small bone fragments is very
difficult, resulting in marked surgical invasion,
and, therefore, surgery should be limited to
cases of old injury showing marked dysfunc-
tion. In fresh cases, conservative therapy should
be primarily selected because adequate func-
tional recovery can be achieved by training
for mouth opening, as in this case.

Conventionally, intra-articular pumping ther-
apy is performed in closed lock of the TMJ.\(^7\)\(^{10}\)
Recently, intra-articular pumping therapy for
temporomandibular joint disease (TMD) has
been performed as conservative therapy for
articular process fracture. Haga et al.\(^4\)
per-
formed pumping therapy for high-condylar
fracture of the mandible, and reported its
effectiveness for the resolution of TMJ pain.
They also performed pumping therapy for low-condylar fracture of the mandible, and
reported a decrease in motor impairment of
the mandibular condyle. In this case, intra-
articul ar pumping therapy was performed to
alleviate discharge of viscous synovial fluid
mixed with blood and pain. From the day this
treatment was commenced, training for mouth
opening was possible, and mouth opening
was achieved early. This indicates that intra-
articul ar pumping therapy is useful for cases
of articular process fracture accompanied by
TMJ pain.

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