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A case with mandibular fracture and cervical soft tissue injury followed by septic clinical course

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Introduction

With a recent increase in occurrence of trauma, an increasing tendency has been also noted in the number of patients suffering a fracture in the mandibular region and the face. Hospital treatment is necessary for many of the patients visiting our clinic with such a fracture. Some of them take an abnormal clinical course during the hospital treatment. A patient who suffered fractures in the mandible associated with an injury in the cervical soft tissues and subsequently developed septicemia with a chief symptom of a high fever, which is the subject of this report.

Case report

A 44-year-old male firstly visited our clinic of Ryukyu Univ. Hosp. on January 25, 1979, with a chief complaint of anomalies of dental occlusion. His medical and family histories were not significant.

On January 25, 1979, he was injured when his head was pressed from both sides with a machine while working in a sugar refinery about 5 o'clock in the morning. After receiving first aid treatment in the emergency hospital in Naha, he was transferred to our department by way of the Naha Prefectural Hospital within the day. Although the existence of unconsciousness, retrograde amnesia and bleeding from the right ear canal following the injury suggested possible lesion in the brain and the skull, no abnormality was found in the skull when he was examined in the Department of Neurosurgery prior to admission.

The patient was well-built and-nourished and looked slightly pale on admission. There was a laceration closed with two stitches in the right retroauricular region. Swelling in the mental region, a laceration of the gingiva in the lower incisivus region, and sublingual hematoma were noted. The mandibular midline shifted from that of the face when the mandible was moved.

Laboratory test, as shown in Table 1, revealed increased white blood cell counts.

Table 1 Hematological examination

	Jan/ 25	Feb/ 8	10	13	16	17	19	Mar/ 5
RBC $\times 10^6/\text{mm}^3$	463	501	419	429	453	454	463	460
HGB g/dl	14.1	15.1	12.7	12.8	13.4	13.7	13.9	13.7
HCT %	44.1	46.0	38.1	39.2	41.4	41.6	41.8	42.8
Platelet $\times 10^6/\text{mm}^3$	182	148		158	198			245
WBC mm^3	11200	4200	2700	2900	4100	3600	4600	5600
Baso %		1		1	3			1
Eosino %				4	4			2
N	Met %				1			
	Band %		68	52	36	62	59	32
	Seg %		9	4	10	7	11	30
Lymph %		18	40	40	17	18	34	27
Mono %		4	3	9	6	1	4	8
Other								
E.S.R. in 1 hour	11	10		15			15	7
in 2 hour	28	33		34			41	21

X-ray films indicated fractures of the mandible in the midmentum and the right condylar process (Fig. 1 and 2).



Fig. 1 Posteroanterior projection

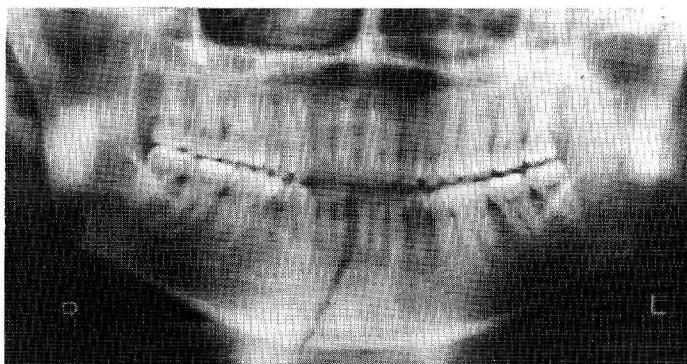


Fig. 2 Panoramic projection

A diagnosis of fractures of the mandible accompanied with a crushing injury in the right retroauricular region was made.

After admission, when the patient experienced nausea, vomiting, and bilateral sensory loss and cramps in the fingers, he was placed under frequent observation for 24 hours.

These complains were improved by the second hospital day. Medication was initiated with Cephaloridine (CER) 2.0 g daily. On February 2, he received surgical operation to reduct the fractures in the mandible and for the fixation between the maxilla and the mendible under local anesthesia.

On February 6, twelve days after injury the patient had a sudden onset of the shaking chills and followed by a rise in temperature up to 38.6°C and received an antipyretic, Indomethacin (Fig. 3). As meningitis was suspected, the patient was examined in the Department of Neurosurgery on the following day, February 7. The diagnosis of the meningitis was denied.

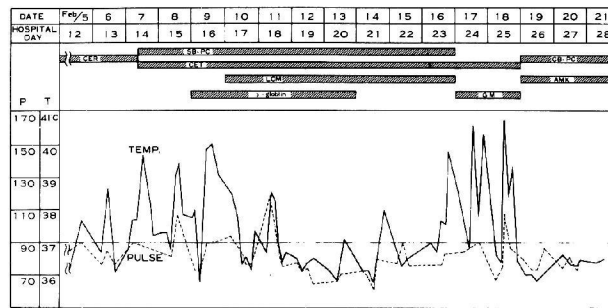


Fig. 3 Clinical course

In the afternoon of the day, the patient developed shaking chills with an elevation of temperature up to 39.6°C again. An induration as large as 20 × 20mm was found on the neck below the right earlobe; the overlying skin is reddened and feverish. The patient complained of spontaneous pain. The crushing injury, being located above the induration in the right retroauricular region, were covered with dried blood clot and the sutures were already removed.

Administration of Sulbenicillin (SB-PC) and Cephalothin (CET), daily 4.0g each, was begun as well as an antipyretic. The temperature dropped to 37.2°C at 21:00. On the following day, February 8, shaking chills began at 16:30 and the temperature rose to 39.4°C at 19:00.

A puncture on the induration in the right side of the neck gave no return of fluid. Several enlarged cervical lymph nodes were bilaterally palpable like a cord along the sternocleidomastoid muscles. The white blood cell count was 4,200/mm³, with 9% segmented neutrophils and 68% bands. A shift of nuclei to the left was noted. Urinary protein was positive.

On February 9, shaking chills began at 14:00 and the temperature rose to 38.8°C at 15:30. Based on the type of fever, clinical symptoms and hematology findings, a diagnosis of septicemia was made.

Blood cultures repeated several times with continued negative results. Treatment was initiated with daily intravenous infusion of SB-PC 10g and CET 5g coupled with human immunoglobulin 5.0g, but failed to fall the fever. On the following day, February 10, Lincomycin, 1,200mg daily, was begun. There was no generalized enlargement of the lymph nodes especially in the axillar and the inguinal regions, except for cervical lymph nodes. Enlargement of the liver and the spleen was not observed. The hematological report showed a further decrease in white blood cell counts down to 2,700/mm³ with 1% metamyelocytes, 4% segmented

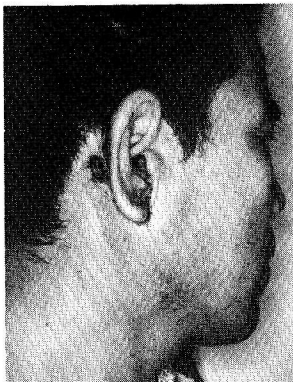


Fig. 4 Soft tissue injury in the retroauricular region

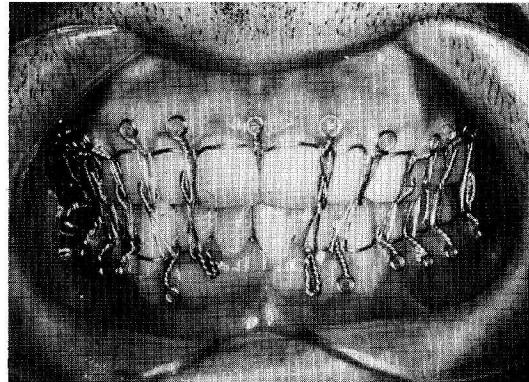


Fig. 5 Intermaxillary wire fixation

neutrophils, and 52% bands. Photographs are demonstrating soft tissue injury in the retroauricular region and oral fixation between the maxilla and the mandible of February 11, (Fig.4 and 5). During a period from February 12 to 15, there was no remarkable high temperature with showing the laboratory data of white blood cell count $2,900/\text{mm}^3$, hemoglobin 12.8g/dl, and urinary protein positiv. A sternal bone marrow aspiration and a lumbar puncture were performed. The myelogram and biochemistry, cytology and bacteriology of the spinal fluid were studied. These laboratory studies were either within normal limits or negative. On February 16, the temperature began to rise at 14:00 again and reached 39.7°C . A spiking temperature up to 40.5°C was noted on the following day. Administration of SB-PC and LCM was discontinued and Gentamicin (GM) was begun at a dose of 160mg daily. Although the fever appeared to fall after Gentamicin transiently, the patient developed an elevated temperature of 40.3°C at 22:20 and the fever remained until next morning. The physical condition of the patient was relatively well when he was afebrile, as being capable of walking, talking and eating. The firm mass on the right side of the neck disappeared and the enlarged left cervical lymph nodes were reduced and not palpable. At 13:00 on February 18, despite these improvement with the local findings, the patient experienced an attack of shaking chills with an elevation in the temperature up to 40.7°C and was treated with an antipyretic successfully. The temperature dropped down to 38.4°C , but rose again as high as 39.4°C at 21:30. On the following day, February 19, the fixation between the maxilla and the mandible was removed. CET and GM were replaced with Carbenicillin (CB-PC) 10g daily and Amikacin Sulfate 400mg daily. Since on the occasion the patient experienced no attack of high fever, hematology was improved, and he was discharged from the hospital on March 14. The patient made satisfactory progress without developing disfunction in the related areas from the mandible to the oral cavity.

Discussion

Generally a septicemia are, characterized clinically by attacks of a high fever accompanied with shaking chills, pains in the joints and extremities, etc. The patients develop feeble rapid pulses, pale skins, cyanosis, rash, occasionally ecchymosis, and frequently headache and clouding of consciousness. Hematological study show anemia and either increased white blood cell count coupled with a shift of neutrophils to the left or decreased white blood cell count. Blood cultures are positive for pathogens. Urine contains small amount of protein.¹⁾

In contrast to earlier times, typical septicemia as mentioned above is very rare recently due to suppression and modification of symptoms, both of which are attributable to abuse or common use of various antibiotics, treatment with corticoids, etc.²⁻⁶⁾ The patient reported in this paper also received chemotherapy at usual doses and antipyretics prior to developing septicemia. Consequently the type of fever was atypical and blood cultures were repeated with continued negative results for pathogens during a febrile periods. A diagnosis of septicemia was made based on the clinical and the hematological findings.

Tetanus was once suspected because of preceding trauma, pain at the site of injury, and rigidities in the cervical muscles, but the diagnosis was denied for lack of cramps in the various muscles including cervical muscles, especially lack of stiffness in the mandible caused by masseteric tonic cramps, difficulty in swallowing, hypersensitiveness, exacerbation of reflex, etc.⁷⁾, as

well as inoculation of tetanus toxoid given in the emergency hospital. Meningitis was denied by the lack of Kernig's sign, Brudzinski's sign, symptoms indicating brain hypertension such as abnormality of consciousness, nausea, vomiting, as well as the results of cytological and bacteriological examinations of smear and cultures of spinal fluid.

Tubercular lesion of the cervical lymph nodes⁹⁾ were also suspected due to bilateral swelling of the cervical lymph nodes, but the diagnosis was denied based on the type of fever, the absence of tubercular focus on the chest X-ray film, and negative reaction of a tuberculin test. Other diseases possibly accompanied with swelling of the cervical lymph nodes were denied depending on the absence of swelling of lymph nodes over the entire body, hematology, the absence of hypertrophy in the liver and the spleen.

As a general rule, chemotherapy for bacterial infections should be preceded by identification of pathogens, followed by selection of optimal chemotherapeutics based on sensitivity tests coupled with consideration of leading to side effects. The antibiotics thus selected should be administered at a sufficient dose.^{2,6)} However, there are some cases in which no pathogen can be detected even if symptoms of infection are definite, the pathogens can not be identified due to indiscret administration of antibiotics, and tests for identification and sensitivity of microorganisms isolated require a lot of time.^{2) 10)} Although the patient reported above was receiving 2.0g of CER during a period following admission, he experienced an attack of a high fever on hospital day 12. Treatment for gram-negative infections was unsuccessfully initiated with sufficiently large doses of SB-PC and CET. Blood cultures were repeated several times with negative results during the febrile periods. Then, infection with anaerobic bacteria was suspected and treatment with LCM coupled with γ -globulin, with which enhancement of resistance in the host and phagocytosis of neutrophils were aimed, resulted in only a transient fall in the fever. The patient developed a high temperature again, although it is not clear whether the transiency of the effect is owing to a discontinuation of γ -globulin or acquirement of resistance to the drugs. Infection with gram-negative rods, especially *Proteus* and *Pseudomonas aeruginosa* were suspected and GM was unsuccessfully administered. Then the chemotherapy was entirely replaced with CB-PC and AMK. Since this occasion, the patient experienced no attack of a high fever and the results of hematological study were improved.

Conclusion

A case report of a patient who suffered mandibular fractures associated with injury in the cervical soft tissues and who was subsequently complicated by septicemia during the hospital treatment was presented. Discussion about the treatment and the differential diagnosis was made.

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