PANEL DISCUSSION

Consensus on treatment Algorithms for Traumatic and Iatrogenic Facial Paralysis

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ABSTRACT: The frequency of head trauma has increased in parallel with the number of high performance vehicles on the road. The 1980s showed the highest frequency of accidents, and thereafter, the frequency of head traumas fortunately decreased as a result of the use of seatbelts. Temporal bone fractures are associated with intracranial injuries in 22% of all head trauma cases.

The initial effect of trauma to the facial nerve is ischemia. This leads to neural edema, which increases pressure in the closed space of the fallopian canal. Decompression surgery is a preventive procedure designed to curtail progression of neural injury due to edema. Approximately 50% of patients who undergo facial nerve decompression surgery achieve excellent functional outcome.

The axis of the fracture line closely affects the hearing, as transverse fractures cross the longitudinal axis of the temporal bone and the labyrinth. In this situation, sensorineural hearing loss is inevitable. The site of the injury in these cases is generally in the middle ear portion of the nerve

The panel concluded that in case of complete, immediate paralysis, the presence of clear cut fracture line in high resolution tomography has been the main indication to decide for the decompression and/or repair of the facial nerve. In delayed cases EMG will be the final and most reliable tool on deciding for the surgery. In contrast ENoG is still very helpful but not descriptive in every case.

For the delayed referrals with complete paralysis, there has been a consensus that the cases should preferably be operated before three months.

In traumatic cases, hematoma, transection and the injury by the bone spicules were found to be frequent causes of the nerve injuries.

Because of the geniculate ganglion which has been the mostly injured portion of the nerve, surgical approach to this area has been frequently required the middle fossa approach. However in some cases with wide access through the attic, transmastoid approach has also been used by some of the panelists. Beneath the previously described landmarks for the middle fossa approach, marking the tegmen with drill was proposed to be helpful on locating the geniculate ganglion. Additionally following the fracture line to find the injured portion of the nerve was also recommended.

The incidence for the gun shot traumas was mentioned to be low.

For the cases with nerve tissue loss, the panel agreed that grafting with cable nerve tissue is advantageous as compared with rerouting. Rerouting technique was blamed to damage the vascular supply of the nerve.

Especially for the injuries nearby the brainstem, anastomosis with the hypoglossal nerve has been the preferred technique. All the panelists mentioned that they are used to perform end to end anastomosis. With this technique it was suggested that more nerve fibers are supplied for the facial nerve. The functional loss of the tongue movements has not been found to handicap the patient.

For the iatrogenic cases the presence of cholesteatoma and granulation tissue was mentioned to be he main risk factors to injure the nerve during surgery. And the second genu of the nerve was the most injured portion.

The increase in vehicular accidents involving head trauma correlates with the number of high-performance vehicles on the road. The highest frequency of motor-vehicle accidents occurred during the 1980s, but after the advent of vehicle seatbelts, the incidence of head trauma sustained in auto accidents decreased. Temporal bone fractures are associated with intracranial injuries in 22% of all cases of head trauma.[1]

From 1966 until the present, much debate has occurred regarding how peripheral facial nerve paralysis should be evaluated and managed. Wallerian degeneration of the facial nerve presents a challenge for otologists, because it is difficult to objectively assess nerve status and plan appropriate treatment. Of all cases of delayed paralysis that develop after temporal bone trauma, the various types of facial paralysis are the most widely discussed in the literature.

The initial effect of trauma to the facial nerve is ischemia, which leads to neural edema that increases pressure in the closed space of the fallopian canal. Decompression surgery is a prophylactic procedure designed to curtail the progression of neural injury due to edema. Approximately 50% of patients who undergo facial nerve decompression surgery achieve an excellent functional outcome.[2] Because most of those injuries occur in the pregeniculate, labyrinthine, and meatal segments of the nerve, the entire facial nerve should be explored during decompression. The choice of approach is dictated by the patient's hearing status. Middle fossa craniotomy should be performed in patients with normal hearing. In patients with acute and severe labyrinthine loss, a translabyrinthine approach can be used instead of the middle fossa approach.[3]

The onset of facial paralysis in trauma cases is so important that all management policies are based on it. In patients with complete paralysis of acute onset, immediate surgery should be considered. However, the neurologic status of the patient or conditions that develop as a result of trauma may not permit surgical treatment. In cases of delayed paralysis, individuals who exhibit less than 90% degeneration within 2 weeks of the trauma are expected to experience a good recovery without surgery. Some cases of traumatic facial nerve paralysis are overlooked during the comprehensive overall workup that is performed immediately after a traumatic accident, and it may not be possible to know whether the onset of paralysis was acute or delayed. In such cases, follow-up like that used in patients with Bell's palsy should be performed.

There are 3 types of fractures of the temporal bone: longitudinal, transverse, and mixed-type. Longitudinal fractures begin with the squamous bone and involve the external auditory canal and cross the tegmen. They then pass in front of the otic capsule and terminate near the foramen spinosum. The axis of the fracture line greatly affects the patient's hearing, because transverse fractures cross the longitudinal axis of the temporal bone and the labyrinth. In such cases, sensorineural hearing loss is inevitable. The site of the injury in these patients is usually in the middle-ear portion of the nerve.[4]

The hearing level of such patients is an important factor in determining the approach to the facial nerve. The middle fossa approach for geniculate ganglion lesions is not used by all surgeons; a pure transmastoid approach that involves dislocating the incudomalleolar joint to expose the proximal facial nerve in an extralabyrinthine manner is preferred by some clinicians.[5]

The prognosis of facial paralysis in patients who sustain trauma by gunshot is poor. Gunshot injury often leads to a condition in which the temporal bone has multiple small fractures, and bullet fragments remain. Because it is not always possible to remove all those fragments, a postoperative ear infection frequently develops. A canal wall-up technique is the treatment of choice for temporal trauma. However, because of the extent of the fractures and the number of bullet fragments usually found in a patient with a gunshot wound, the use of the canal-down technique is often required. A controversial issue is whether the cavity should be left open or closed. After fat tissue has been used to obliterate

the mastoid cavity, closure of the external ear canal is the best method of protecting the nerve graft.[6].

Iatrogenic facial nerve injury occurs more frequently after radical or modified radical mastoidectomy than after either intact bony external auditory canal procedures or surgery to treat atresia.[7] Dehiscence of the facial nerve bony canal or the abnormal location of the facial nerve may predispose a patient to sustaining nerve damage during surgery. The incidence of iatrogenic facial paralysis associated with otologic surgical procedures has been estimated to range between 0.6% and 3.6%.[8]

The time of the onset of iatrogenic facial paralysis is also important. If that onset occurred immediately after the ear surgery and the development of a nerve block due to the infiltration of an anesthetic has been ruled out, then the ear must be reexamined as soon as possible. If there is any doubt regarding the physical integrity of the facial nerve, it may be best to use ENOG to monitor the patient and to perform nerve repair if the patient demonstrates no recovery or a poor recovery (ie, an HB grade of V to VI). However, patients with delayed palsy must be monitored by ENOG, and their follow-up should be similar to that of patients who have experienced a delayed trauma.[9]

Although common policies for managing traumatic facial paralysis exist, a consensus about certain aspects of treatment remains to be established. The more controversial aspects of the management of traumatic facial paralysis will be discussed by the experts who participated in the following roundtable discussion.

O. Nuri Ozgirgin: **How often does facial paralysis develop in patients with a temporal bone fracture?**

Roberto Filipo: We do not see these patients often. The facial paralysis that we most often treat is associated primarily with temporal bone trauma. Fortunately, patients with gunshot trauma or a penetrating injury are very rare; we treat about 4 cases of traumatic facial paralysis per year.

O. Nuri Ozgirgin: **Facial paralysis can also develop in patients with a transverse fracture. In those cases, the external auditory canal skin is usually intact, and the primary symptoms are sensorineural hearing loss and vestibular problems. In fact, the incidence of facial nerve paralysis is higher in patients with a transverse fracture than in those with longitudinal. How (and how often) does your practice treat patients with a transverse fracture?**

Mislav Gjuric: In our practice, we treat transverse fractures infrequently. When patients with that type of fracture do not have a brain injury, the ENT [ear, nose, and throat] clinic staff treat the patient initially, but when there is intracranial involvement, we usually receive the patient after the neurosurgery department has completed its work. In patients with a transverse fracture, the clinical signs (sensorineural hearing loss, vestibular disorders, severe facial nerve paralysis) are quite dramatic.

O. Nuri Ozgirgin: **In patients with temporal bone trauma, the paralysis may be immediate or delayed. In those with immediate and complete paralysis, is further examination required?**

Anestis Psifidis: Those patients should undergo a complete workup. After a through physical examination has been conducted, a CT [computed tomographic] scan should be performed. The results of the examination of the external auditory canal are also important. Audiologic tests will show the conductive and sensorineural components of any hearing loss. Electrophysiologic tests to determine nerve regeneration should be performed after the third day of the facial paralysis. In patients with immediate and complete paralysis, exploration of the nerve should be performed as soon as possible.

O. Nuri Ozgirgin: **Facial paralysis may develop even if a fracture line cannot be identified. How often do you treat such patients, and how do you treat them?**

Carlos Cenjor: We usually see these patients several days after their traumatic injury, during which time their

vertigo and dizziness usually improve. CT is a very important tool in their evaluation. Obtaining accurate information about the severity of the lesion in the nerve is essential. In patients with a partial injury of the nerve, you may follow the patients but in cases with complete nerve sections it should be repaired as soon as possible.

O. Nuri Ozgirgin: **Because of central nervous system involvement, it is often impossible to determine whether complete paralysis occurred at the moment of injury, and the results of electrophysiologic evaluation can direct the choice of surgery. In such cases, do you rely on ENOG [electroneurography] findings, do you wait for EMG [electromyography] results?**

Roberto Filipo: The evaluation of the temporal bone with high-resolution CT (64 cuts) is important. We must carefully evaluate the CT slides to identify the site of the injury. The first impression obtained from those CT slides provides essential information, and we can then consider the results of ENOG and EMG. MRI [magnetic resonance imaging] is useful, because using a gadolinium technique to identify an intensive inflammatory reaction over the nerve can be helpful.

O. Nuri Ozgirgin: **As long as this is a consensus session, I would like to ask the other panelists whether they agree with Dr. Roberto Filipo about first relying on the results of CT. Professor Filipo, if complete paralysis and prominent injury are identified via CT, then you do not wait to evaluate the patient with EMG, correct?**

Roberto Filipo: In patients with a wide fracture line, it is possible to anticipate the results of ENOG and EMG.

Mislav Gjuric: I agree with Dr. Filipo. The only indication for immediate surgery of the facial nerve is the clear-cut proof of the section of the nerve, which can be supplied by the results of CT that show a prominent fracture caused by a gunshot wound or another type of penetrating injury. Surgery for paralysis from any other cause can be postponed for at least 2 weeks so that electrophysiologic testing can be conducted. I would perform immediate surgery only in patients with a gunshot-related trauma or a prominent fracture.

Jona Kronenberg: A hematoma on the geniculate ganglion can be caused by a fracture line that cannot been identified on CT.

Mislav Gjuric: In such cases, you might want to operate immediately, but to do so in every patient with complete paralysis would be overtreatment.

Jona Kronenberg: You should rely on the results of ENOG.

Mislav Gjuric: In such cases, it is necessary to evaluate the patient electrophysiologically.

O. Nuri Ozgirgin: **Then if a clear fracture line is evident on CT and complete paralysis has been confirmed, would you perform surgery immediately?**

Carlos Cenjor: If I am sure that there is a complete section of the nerve, then I do not wait for the results of EMG before I perform surgery.

Anestis Psifidis: To determine whether the paralysis is complete, you must perform electrodiagnostic tests. Even in patients with a clear-cut section, you must wait for the results electrophysiologic tests to be able to approve the nerve section.

O. Nuri Ozgirgin: **In cases of delayed referral, how long can surgery be postponed?**

Mislav Gjuric: The optimum time is around 3 weeks after the traumatic incident, when the likelihood for neuronal repair is maximal. I do not believe that we lose time if we do not perform surgery within the first 3 weeks after injury. In cases of late referral, the results of

surgery performed within the first 3 months after injury are still encouraging.

Roberto Filipo: In the past, I have seen cases of nerve injury caused by bone chips. Postponing the surgery results in a less successful outcome. Nerve-related surgery performed more than 3 months after injury is unnecessary.

Carlos Cenjor: If stimulation of the neuromuscular junction can be performed any time (1 week, 1 month, 1 year) after injury, then the prognosis is good, but when it is not possible to perform that procedure, the prognosis is not good and performing surgery during the first 3 weeks after injury should be considered.

O. Nuri Ozgirgin: **If there is CSF [cerebrospinal fluid] leakage, would you use the middle fossa approach?**

Mislav Gjuric: A CSF leak is not a contraindication to the middle fossa approach. The choice of surgical approach depends on the patient's hearing status. In those with good hearing, I perform the middle fossa approach, even in patients with CSF leakage or a dural tear. Dural repair can be performed during the same surgery.

Roberto Filipo: In patients with CSF leakage, I postpone surgery for several days, during which treatment with lumbar drainage and antibiotic therapy is initiated. If the CSF leak does not stop within 1 week, we perform surgery. The approach used is determined by the fracture line, and we combine the mastoid and middle fossa approaches. During the mastoid approach, making a hole near the middle fossa may facilitate finding landmarks. If CSF leakage is noted, I will explore the middle fossa.

Carlos Cenjor: Lumbar drainage usually controls CSF leakage, and I wait for the control of that leakage before doing the surgery.

O. Nuri Ozgirgin: **In cases of wound contamination, what would be your intervention?**

Mislav Gjuric: In patients with wound contamination and a CSF leak, I would first treat the infection and the leak; I would delay the repair of the nerve.

O. Nuri Ozgirgin: **How do you treat patients with partial paralysis?**

Roberto Filipo: Patients with partial paralysis are not surgical cases. I obtain the results of CT, MRI, and EMG and prescribe treatment with methylprednisolone 1 mg/kg.

Carlos Cenjor: I agree with Dr. Filipo.

Anestis Psifidis: I agree. Observation and medical treatment are required.

Mislav Gjuric: I agree.

O. Nuri Ozgirgin: **Which tests do you rely on for patients with delayed but complete paralysis?**

Mislav Gjuric: In patients with delayed complete paralysis, I rely on the results of EMG rather than on ENOG. We also perform other evaluations such as Schirmer's test, audiometry, and stapedial reflex tests, but I do not rely only on their results. Regarding physiotherapy and rehabilitation, eye care is of utmost importance in the acute phase of paralysis. Some clinicians prescribe electric stimulation during that phase, but I believe that is completely wrong.

O. Nuri Ozgirgin: **Can partial delayed paralysis be considered Bell's paralysis?**

Roberto Filipo: Twenty years ago, we were much more aggressive in treating patients with partial delayed paralysis. Now, the medicolegal aspects of such treatment must be considered; for example, in cases of healing paralysis during which the nerve sustains additional trauma during surgery. You must be very careful in performing surgery in patients with delayed paralysis. If the patient's electrophysiologic responses suddenly decrease and if I cannot get an electrophysiological response, then I may perform surgery.

Carlos Cenjor: The most important test results on which to rely when the need for surgery is determined in patients with delayed paralysis are those from EMG.

Roberto Filipo: We have longstanding experience with the Kabat method, which enables faster recovery. To maintain muscle activity, we immediately implement treatment with that method. It is important to be soft at the beginning to maintain the muscle activity.

Anestis Psifidis: In patients with delayed complete paralysis, we rely on the results of EMG and ENOG.

O. Nuri Ozgirgin: **What is the main pathologic effect of trauma on the nerve itself? Hematoma of the nerve? Transection of the nerve?**

Roberto Filipo: I usually observe transection and injury made by bony spicules. Fibrosis also eventually appears. I use MRI, which provides good information, more and more often to detect pathologic conditions of the nerve.

Mislav Gjuric: In transverse fractures, total transection of the nerve frequently occurs. Bony spicules that injure the nerve and an intact nerve with only edema can also be seen.

Jacques Magnan: In my experience, transection is uncommon. Compression of the nerve with bony spicules, which occurs much more frequently than does transection, usually develops near the geniculate ganglion (a condition revealed by CT).

O. Nuri Ozgirgin: **Do you often see fibrosis of the nerve after a penetrating injury?**

Jacques Magnan: In our patient population, car accidents and crush injuries are much more common than trauma by knife. In patients with fibrosis, anastomosis of the nerve is the only solution.

O. Nuri Ozgirgin: **What is your policy on decompressing the nerve in patients with traumatic paralysis? Total decompression?**

Roberto Filipo: The middle fossa approach is used primarily, but the nerve should be opened only in patients in whom the fracture line passes through the middle fossa. However, you can often decompress the first part of the facial nerve via the transmastoid approach.

O. Nuri Ozgirgin: **Is the geniculate ganglion greatly susceptible to trauma?**

Roberto Filipo: Yes; thus the middle fossa approach is the best technique for reaching the geniculate ganglion. Sometimes a combined approach may be necessary.

Carlos Cenjor: I agree. I use the middle fossa approach in general. However, if the attic is large enough, a transmastoid approach can also be used.

Anestis Psifidis: I use primarily the middle fossa approach.

Mislav Gjuric: The most frequently injured parts of the nerve are the labyrinthine portion, the geniculate ganglion, and the tympanic portion. The decision of which approach to use depends on the fracture line. You can also see the geniculate ganglion via the transmastoid approach, but for manipulations of the nerve (grafting, etc) you need more space, so the middle fossa approach has distinct advantages. Then, if necessary, that approach can be combined with the transmastoid approach. I would start with middle fossa approach and then convert to the transmastoid approach, if necessary.

Jacques Magnan: The geniculate ganglion is the weakest point of the fallopian canal. The longitudinal fracture first meets the second portion of the fallopian canal and then continues to the geniculate ganglion. Regarding transverse fractures, the bone weakens between the cochlea and labyrinth, and if you look at the

anatomy of the facial nerve, you'll note that the sheath in the second and third portions is resistant to injury, but in the first portion there is no protective tissue. If a fracture line develops, the nerve will sustain a deep injury, so we start with the middle fossa approach and may later continue with the mastoid approach. I want to emphasize that you should not rely on the fracture line on the mastoid only. It is important to remember that a second fracture line is frequently found over the geniculate ganglion.

O. Nuri Ozgirgin: **Dr. Magnan, what are your landmarks for the middle fossa approach?**

Jacques Magnan: I examine all the structures, but if there is a hematoma or bleeding, I also follow the fracture line.

Mislav Gjuric: In patients with a fracture line but an intact nerve, I sometimes open the epineurium to relieve the pressure on the nerve fibers.

Roberto Filipo: I perform mastoidectomy and make a hole near the geniculate ganglion, from the attic toward the middle fossa. That sign is very useful in locating the geniculate ganglion on the middle fossa side.

Carlos Cenjor: I perform the transmastoid approach, and if the anatomy through the attic permits, I access the geniculate ganglion via the mastoid approach; otherwise, I use a combination approach.

Anestis Psifidis: Removing the incus creates a better angle from which to access the geniculate ganglion through the transmastoid approach.

O. Nuri Ozgirgin: **How do you treat gunshot trauma?**

[The panel members had limited experience with the effects of bullet-related trauma on the temporal bone.]

O. Nuri Ozgirgin: **What is your technique for treating the nerve itself? How do you treat the nerve in patients with a hematoma, partial transection fibrosis, or a neurinoma?**

Jacques Magnan: It depends on the pathologic condition that is affecting the nerve. If the nerve is intact and you are performing decompression, the epineurium should not be opened. A study done by Saito[10] revealed that leaving the epineurium intact resulted in a faster and more complete improvement in facial function. If a neuroma develops, you should excise it and then create an anastomosis, which is much easier in the temporal bone. I do not use any material as long as the temporal bone provides a stable bed for the replaced nerve tissue between the cut ends of the facial nerve. Usually, no treatment is required to repair the nerve endings.

Mislav Gjuric: In patients who required partial transection, I tried inserting small grafts between the injured ends of the facial nerve, but I have never been satisfied with the results of that technique. Now I transect the nerve completely, after which creating an anastomosis is easier.

Anestis Psifidis: In patients in whom more than 50% of the nerve is transected, it is better to cut the nerve completely and then create the anastomosis.

Carlos Cenjor: In patients with a hematoma, decompression is enough. When there is a neurinoma, the nerve should be transected and grafting should be performed.

Roberto Filipo: If you can operate on an injured nerve immediately after a traumatic incident, then neither fibrosis nor a neurinoma will develop. For the treatment of injuries affecting less than 50% of the nerve, I preserve the remaining fibers, but if the injury affects 50% or more of the nerve, then the remaining fibers are cut with precision to ensure the creation of a better anastomosis or a cable graft. I usually prefer to perform a cable graft, because rerouting creates more damage to the nerve.

O. Nuri Ozgirgin: **In cases of tissue loss, which is preferable: rerouting or the creation of a cable graft?**

Roberto Filipo: A cable graft.

Carlos Cenjor: Rerouting deals with the vascular supply of the nerve. Rerouting the reinnervation is slower and the outcome is worse than when cable grafting is performed.

Anestis Psifidis: In case of creating tension to the nerve endings with rerouting, cable graft should be preferred.

Mislav Gjuric: If cable graft insertion is performed, a 2-sided anastomosis must be created. This can sometimes be a disadvantage, but when the sequelae of that procedure are compared with the effects of injury on the blood supply of the nerve (which can occur after rerouting), it may not be disadvantageous. If the patient has a small defect within the temporal bone, an end-to-end anastomosis can be performed. If there is a defect near the cerebellopontine angle, a cable graft should be used. The choice of the technique used should be determined on a case-by-case basis.

Jacques Magnan: I fully agree with Dr. Gjuric. The extratemporal part of the nerve can be sutured end to end; however, there is no space in the temporal bone to create an end-to-end anastomosis for any defect larger than 8 mm. Good results have been obtained with various neurotrophic factors and nerve channels in animal models, and using those techniques in humans may enable successful nerve regeneration.

Carlos Cenjor: After suturing the nerve, I use glue and fascia to make anastomose.

Roberto Filipo: I use fine sutures. I would like to ask the panelists about their best result with a cable graft, which in my experience has been HB III.

[All panelists agree.]

Jacques Magnan: It should be mentioned that postparalytic spasm, which distorts the mouth, always develops.

O. Nuri Ozgirgin: **When an anastomosis of the hypoglossal nerve is necessary, which technique do you use: end to end or side to end?**

Roberto Filipo: In the past, we have always created a total anastomosis, but we are starting to perform side-to-end anastomoses by splitting the hypoglossal nerve. However, I cannot compare those techniques.

Jacques Magnan: Thus far, we have performed only end-to-end anastomoses. In patients with chronic facial paralysis, enabling the rehabilitation of facial muscle function by providing as many functioning fibers to the facial nerve as possible is a good idea. Deciding which anastomosis to use during surgery in 2 of our patients with a facial neurinoma proved difficult. When you compare the sequelae of complete facial paralysis, I think that tongue dysfunction should not be a concern. If you can perform the anastomosis immediately, you will achieve a very good result.

Mislav Gjuric: We have also begun to use side-to-end instead of end-to-end anastomosis. Anestis Psifidis: We have had fairly good results with end-to-end anastomosis.

Carlos Cenjor: I always prefer end-to-end anastomosis. I use the transmastoid approach to relieve more nerve tissue; otherwise, suturing the nerve near the stylomastoid foramen is not easy.

O. Nuri Ozgirgin: **What achieves the best result in hypoglosso-facial anastomosis?**

[All panelists agree that HB Grade III is the best result that can be achieved with hypoglossofacial anastomosis.

Roberto Filipo: The use of the Kabat technique may help to minimize synkinesis.

Jacques Magnan: A few weeks ago during an acoustic neurinoma conference in Barcelona, Spain, there were many presentations on kinesiotherapy as well as anastomosis. We have to improve this technique.

Mislav Gjuric: In some countries, clinicians are using electrical stimulation very aggressively but with devastating results. We should strongly recommend against the use of electrical therapy in such patients.

O. Nuri Ozgirgin: **Which part of the nerve is more prone to trauma during middle ear surgery? Which type of middle ear pathologic conditions (tympanosclerosis, cholesteatoma?) are associated with intraoperative nerve damage? When should the nerve be repaired, and who should repair it?**

Roberto Filipo: In my experience, iatrogenic injuries occur frequently in patients with a cholesteatoma or granulation tissue. In patients with tympanosclerosis, traumatizing the nerve requires very aggressive action. In patients undergoing neurotologic surgery, however, the nerve is more susceptible to trauma.

Jacques Magnan: In well-developed countries in which more training is available, we see less and less iatrogenic trauma. The nerve is usually injured near the second genu. The radiologist should warn the surgeon that the nerve is exposed in its intratemporal course. The usual mistake is that the surgeon assumes that he or she is drilling the scutum while drilling the second genu of the nerve. The labyrinth is also involved in trauma of the facial nerve. The surgeon may think that he or she has not found the facial nerve, even though that nerve has already been damaged. Even an experienced surgeon can injure the nerve during revision surgery. If the third portion of the nerve is exposed, the nerve can be injured while the surgeon is elevating the diseased tissue.

Mislav Gjuric: During neurotologic surgery, the patient's condition itself injures the facial nerve; this should not be considered iatrogenic trauma. Grafting in the cerebellopontine angle is difficult. Gluing the nerve ends after stabilization with fascia is preferred.

Roberto Filipo: I recently treated a patient with a 2-cm neurinoma near the cerebellopontine angle. This patient had experienced 3 so-called Bell's palsy attacks. Following a long surgery a relaxed surgeon should make the repair if possible.

Carlos Cenjor: Temporary facial weakness due to the effects of a local anesthetic should be ruled out. I agree with the reminder of Dr. Filipo's statement.

Anestis Psifidis: In patients with immediate facial weakness, the effect of a local anesthetic should be considered. If the palsy persists, then the nerve should be reexplored, but if the surgeon is aware of the nerve lesion, then immediate repair can be performed.

O. Nuri Ozgirgin: **Who should repair the nerve?**

Anestis Psifidis: An experienced surgeon can perform that repair.

Roberto Filipo: For long surgeries the primary surgeon should stay outside for the nerve repair.

O. Nuri Ozgirgin: **I hope that we have successfully addressed crucial points in the management policies of patients with traumatic facial paralysis. Thank you.**

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