



# The New Face

**In November 1992 Jewgenij Sewerin, a Russian forester, was attacked by a bear – most of his face was ripped off. He was left with a huge hole in his face – one eye, his upper jaw and his nose were missing. In 1997 Dr. Gerolf Gehl, Head of the Department of Epithetics, Craniofacial Prosthetics and Implantology at the University Hospital in Zürich created the concept and fabricated the facial prosthesis that finally allowed Mr Sewerin to return to his family and his life.**



Jewgenij Sewerin, a forest ranger, was left in total isolation from the outside world for almost four years after this horrendous attack. The bear tore away most of his face. At the beginning of 1996 he was finally able to travel to the Clinic for Holistic Medicine in Langenthal, Switzerland. This was only possible through the actions of Dr. Kurt Blatter, head of the hospital. Dr. Blatter organised, managed and funded Jewgenij's entire rehabilitation.

An intensive programme of surgery was carried out at the Inselspital (hospital) in Bern by a team lead by Prof. Joram Raveh within the Department of Skull and Maxillofacial Surgery. His team rebuilt Mr Sewerin's face as far as possible; but even today's most sophisticated surgeons cannot reconstruct such complicated organs as eyes and noses. This is where Dr. Gerolf Gehl from Zürich took over. As an academic sculptor and maxillofacial prosthodontist he created a new mid-face for the patient. This remodelled face had to look not only as natural as possible but also must protect his face from the cold of the Siberian winters.

His treatment had attracted intense media coverage, but how did his doctors see this case from a medical point of view? "In retrospect," commented Prof. Raveh, "this case was extraordinary. The bear had ripped off the whole of the mid-face, including bones and soft tissue, lips and the nose frame. The lower incisors of the animal severely damaged the frontal base of the skull and the cerebral membrane. It is a wonder that he survived at all."



*The situation when the patient was initially referred to Dr Gehl*

## Surgery

The team went into detailed and lengthy planning prior to the first reconstructive procedure. At first a 1:1 plastic model was prepared from 3-dimensional CT pictures. This model (stereolithographic skull) showed the bone defects and allowed surgeons to tell the size and form of the bone transplantations that would be required. This first surgical procedure took 24 hours during which the team performed a specific technique developed by the professor which was intended to reduce complications. Despite this, there was an unexpected problem: "It became obvious that part of the cerebral membrane was missing, pus had gathered and parts of the brain were lying open".

The necessary bone needed for reconstruction was taken from the skull-cap and formed and fixed in place with titanium plates as a replacement for the missing cheekbone and orbital cavity. A further graft of bone and tissue was taken from the shoulder. This was intended as bony replacement for the upper jaw and as a skin graft for reconstruction of the oral cavity and to replace the missing facial skin.

The most important requirement for the success of this type of transplant is to reconstruct the blood circulation. To obtain this, the vessels were re-connected under the microscope (in this case using the still intact neck vessels). The surgery was made very difficult due to the small diameter of these vessels.



*The cranio-maxillofacial surgery provided a good basis for the prosthetic work to begin*



*As the prosthetic work progressed, the temporary prosthesis offered a better solution than the black bandage*



*After 6 months the facial prosthesis attached to minimagnets was finished*

Five more surgeries took place after the initial work. The graft was modelled and a 'cave' was created for the eventual eye prosthesis. A new nasal cavity was formed. This was important as it followed normal conditions for the intake of air and would help to prevent future disease to the bronchial system. This was followed by the formation of a new upper lip using a method, described by Prof. Raveh in 1981, which involves taking a graft from the lower lip without leaving visible incisions or scarring. In the newly created upper jaw the dental implants were placed. Dr. Regina Mericske was responsible for the construction of the intra-oral prosthesis which was attached to implants already placed. Later, Dr. Gehl planned the extra-oral implant placement in close co-ordination with the surgical team.

## Prosthetics

The surgical reconstruction of the nose and eye would have taken a couple of months taking into account the healing period. Even then, the aesthetic result would have been modest because of the complete destruction of the bones and soft tissue. Dr. Blatter realised that the patient was definitely not in the frame of mind to endure any more operations and delays. After all these years of living in total seclusion he was at the end of his physical and emotional strength. On top of this he was suffering from severe homesickness aggravated by the fact that he could only communicate with the help of a translator. Discussing these underlying problems Dr. Blatter decided to contact the Department of Epithetics in Zürich. It was for exactly this type of case that Dr. Gehl had presented a concept in 1993 known as step-by-step rehabilitation,

using glasses to retain the prosthesis. This would provide the patient with an immediate interim solution until either the definitive implant retained prosthesis could be fitted or the ongoing reconstructive surgery could take place.

Dr. Gehl remembers that his colleagues originally wanted to have a prosthetic reconstruction on bars and clips for this patient. In this case Mr Sewerin would have waited some months more during the osseointegration period before the final facial prosthesis could be fitted. "I realised that Mr. Sewerin was in a severely strained state of mind and would probably not be able to bridge the healing time of the implants without a temporary prosthesis or even, at worse, having to wear his black bandage again," he recalls. "That's why at first I recommended a spectacle born prosthesis as a temporary solution before fabricating the final implant retained prosthesis."

It is Dr. Gehl's top priority to offer an interim solution immediately to the patient. In doing so the patient is able to slowly become accustomed to his or her new look, and to gain realistic expectations of what is possible with a prosthesis before the final one is fitted. This helps to stabilise the patient mentally and restore his hope for the future. With his 'new face' this did not take too long for Jewgenji and he was soon taking part in sailing trips and social events in Switzerland with the new friends he had made during his long stay. "Although it is a very depressing situation to literally lose one's face, our patient began to enjoy invitations again and coped well with his newly won quality of life," states Dr. Gehl.

"For the extra-oral implant retained rehabilitation I



*After 4 years the implants, magnets and surrounding skin are stable and functioning well.*

recommended Brånemark (now Entific) implants and abutments,” explains Dr. Gehl. “I wanted to use the Magnacap minimagnets with a lip, as these lip magnets would stabilise the prosthesis against sideways shifting forces.” In his concept Dr. Gehl omitted parallelism and the bar construction by using freestanding abutments which would simplify both the surgery and prosthetics. He limited the design to the pure silicone fabrication of the epithesis, using magnetic fixation. “This method simplifies the surgical and prosthetic concept and reduces the amount of technical work required. I preferred single freestanding abutments because they would be much easier to clean than a huge framework of bars and clips which could have presented a hygiene problem. As the patient lives in Russia we knew that he would only be able to come for follow-up every year or so. We used three implants in the orbital rim and one placed in the nasal cavity.”

## Compromises

Over the course of the various surgeries the team had to make some compromises. It would have been possible to create a nose from the patient’s tissue but, due to the consistency of the tissue, it would have been unaesthetic and would probably have drawn attention to the defect rather than disguising it. As skin could not be taken from the forehead the decision was taken to provide a mid-face prosthesis including a nose. “We also debated trying to correct the position and angle of the remaining eye, but we were concerned about endangering the optic nerve and this was too great a risk as he only had one functioning eye after the attack,” says Prof. Raveh.

## Four years later

Jewgenij Sewerin recently visited the Department of Epithetics, Craniofacial Prosthetics and Implantology at the University Hospital in Zürich for a follow-up visit.

“We are delighted that four years since the final prosthesis was fitted, his facial restoration is still stable and has hardly changed,” says Dr. Gehl. “The implants in the orbital rim are fully integrated. We are not using the one placed in the nasal floor because gathering moisture might have caused problems here so, for the time being, it remains as a sleeping fixture.”

## Jewgenij Sewerin Recalls

The extent of his injuries and the years of surgery and restoration work have meant that Jewgenij has faced a long period of rehabilitation and changing expectations.

But ten weeks after the first operation in Bern, Jewgenij was walking around the old city – and he no longer felt he had to hide. “I looked to see if people stared at me – they didn’t.” Going home to Russia for the first time he accepted that his face had changed for ever and his children were so happy for him: “I am just pleased he looks human again. He no longer needs to hide, he can go out, meet people,” said his son.

“It’s difficult to reconstruct a person’s face,” says Jewgenij. “At first I had hoped for a solution with my own tissue but after all the operations I came to realise that this was impossible. I had moments of total desperation and anger; at times I even lost confidence in the doctors. I got used to the temporary prosthesis and struggled to accept the final one. But now I feel good when I look in the mirror. Thank God, the face has turned out well.”



*At his 4 year follow-up visit Jewgenij is photographed wearing the original facial prosthesis which is still in good condition.*