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PRIMARY RECONSTRUCTION OF MANDIBLE IN HEAD AND NECK CANCER WITH SILASTIC IMPLANT - A REVIEW OF 69 CASES

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SUMMARY

Different methods of primary mandibular reconstruction carried out at the Tata Memorial Cancer Hospital range from the pectoralis major myocutaneous or osteomyocutaneous composite flap, which is the most frequently performed procedure, to a free vascularised composite tissue transfer with microvascular anastomosis, including, iliac crest free vascularised bone grafts or radial artery forearm flap free vascularised radius bone grafts, free vascularised fibular bone grafts and silastic mandibular implants. The clinical results of immediate mandibular reconstruction with a silastic mandibular implant (SMI) in 69 patients is presented. Out of the 69 cases, 2 patients died in the early post-operative period. Twenty (30 %) SMI were retained for a period of 1 year to 5 years. Forty seven (70 %) SMI were retained for a period of less than 1 year. These implants have been used in a variety of cases, with or without major flap reconstruction, where a skeletal support was indicated, especially after mandibular arch resection. The results of this series indicates the importance of these implants as a short term spacer, even in advanced, fungating lesions of head and neck cancer where the risk of infection, haematoma and salivary leak is very high. Bone replacements were undertaken at a later date in suitable cases. The effects of preoperative chemotherapy and radiotherapy on the retention of these implants has also been studied.

ZUSAMMENFASSUNG

Primäre Rekonstruktion des Unterkiefers bei Krebskrankheiten des Kopfes und Halses mittels eine Implantation von Silastic - eine Übersicht von 69 Fällen

H. M. Bhathena, N. M. Kavarana

Verschiedene Metoden der primären mandibularen Rekonstruktion durchgefürt in dem Tata Memorial Krebshospital varierten vom einem myocutanen bis zum osteomyocutanen Lappen (m. pectoralis major), die ist die amhäufigsten angewandte Prozedur bei einer freien komplexen Übertragung der Gewebe einschliesslich einer mikrovascularene Anastomose, und eines freien vascularisierten Lappens das dem iliac Kamm, oder aus der radialen Arterie des Unterarms ergänzt durch eine vascularisierte Implantation aus dem radialen Knochen, einerer freien vascularisierten Implantation aus dem fibularen Knochen und mandibulare Implantation von Silastic. Klinische Ergebnisse unmitteibar nach der mandibularen Rekonstruktion durch die mandibulare Implantation von Silastic (SMI) ist bei 69 Patienten beschrieben. Von diesen 69 Fällen sind zwei Patienten während der frühen postoperativen Periode gestorben. Die Verfolgung erfolgte bei zwanzig (30 %) SMI ein -bis - fünf Jahre, bei 47 (70 % SMI) Kranke wenig als ein Jahr. Diese Implantaten wurden bei unterschiedlichen Patienten mit oder ohne einer Rekonstruktion mit grössen Lappen angewandt in denen, wo eine Resektion des Unterkiefers indiziert war. Die Ergebnisse bei diesem Krankengut erwiesen den Wert eine diese Implantate, zur kurzzeitigen Aufrechterhaltung eines genügenden Raumes auch im Falle von umfangreichen bösartigen Tumoren in Kopf - und Halsbereich, wo eine grosse Gefahr von Infektion, Hematom und Speichelexcretion besteht. In indizierten Fällen erfolgte später ein Knochenersatz. Die Wirkungen der preoperativen Chemoterapie - bzw. Radiotherapy wurde ermittelt.

Key words: primary mandibular reconstruction, silastic mandibular implant.

Surgical defects following ablative cancer surgery in head and neck cancer, especially the middle third of the mandible and floor mouth lesions, involving full thickness resection including mucosa, skin and bone, have a tremendous impact on the patients' quality of life. In buccal mucosa lesion where hemimandibulectomy has been performed, leaving the mandibular remnant to swing without skeletal reconstruction provides adequate function with limited morbidity. Mandibular reconstruction is not done routinely in such cases. Skeletal reconstruction is mandatory in middle third mandibular defects in floor mouth lesion, involving full thickness resection including

mucosa, skin and bone. Early cosmetic and functional rehabilitation is far superior with primary reconstruction in arch resection, rather than secondary reconstruction associated with contracture and scarring.

About 30 % of the total number of cancer patients seen at TATA MEMORIAL CANCER HOSPITAL have head and neck cancer. Out of this 6% require mandibular resection (lower alveolus 1.5%, floor mouth 0.3%, and buccal mucosa 4.1%) (1). We wish to present our experience in the use of Silastic Mandibular Implants (SMI) for primary mandibular reconstruction in those patients requiring mandibular resection, and where other forms of reconstruction were contra-indicated or not desirable.

This article analyses our experience with this method of mandibular reconstruction.

MATERIALS AND METHODS

Sixty-nine patients reconstructed primarily with silastic mandibular implant were reviewed from 1980 to 1991. Of these, 61 had squamous carcinoma of different grades either arising from the lower alveolus or surrounding tissues, while 7 were benign lesions of the lower alveolus and one was small cell sarcoma of the mandible. Factors like pre and postoperative treatment with chemotherapy and/or radiotherapy, stage of the disease and extent of the resection of the mandible were analyzed. The effects on speech and swallowing were noted as well as the cosmetic results.

The mandibular defects ranged from incisor arch of the mandible in 31 cases, angle to angle in 14 cases, hemimandible in 9 cases, incisor arch plus hemimandible in 10 cases and segmental mandible in 5 cases with or without mucosa or skin loss. Of the 69 operated patients, 2 died in the early postoperative period. Out of 67 cases, in 15 cases skin and mucosa were closed primarily, and SMI was used for the skeletal support. Some form of reconstruction along with SMI was required in the remaining 52 cases, of which 29 cases had a folded, bipaddled pectoralis major myocutaneous flap (2, 3) for mucosal and external skin cover, 18 cases had pectoralis major myocutaneous flap for inner lining combined with deltopectoral flap for external skin cover, 4 cases had deltopectoral flap for external skin cover combined with local tongue flap for mucosal closure. In one case mucosa was closed primarily with a local rotation flap for skin cover.

SURGICAL TECHNIQUE

Silicone rubber is to date the most inert material available for the implantation and it can be moulded and cured in different shapes. We have prepared two types of silicone mandibles. One design is a slim variety which acts as a strut, while the second one has the exact size and shape of the resected mandible (Fig. 1) and can be precisely fitted in the skeletal defect. After the excision is over, the defect is measured and selection of SMI is made. The slim or the normal design is selected depending on the extent of excision of the mandible and the surrounding soft tissues. The SMI is fixed with the mandibular remnants in an overlapping fashion after drilling holes through the bone. A lap-joint is prepared by reducing the opposing surfaces of the bone and the SMI, and it is fixed by stainless steel wires. Mucosa is closed in two layers either primarily or with an appropriate flap before introducting the SMI. A thorough irrigation of the wound with chloromycetin saline solution is carried out prior to implanting the SMI. This is to reduce the potential contamination of the surgical wound by saliva. The implant itself is handled carefully to prevent any contamination. The SMI is carefully covered with the available remnants of muscles like pterygoids and masseter muscles. The muscles of the floor of the mouth, if available are also reattached to the SMI to re-establish their functional integrity. The

Fig. 1. Two different designs of SMI as described in the text.

Fig. 2. An extensive floor of mouth and middle third mandible excision.

wound is closed in two layers with a negative suction drainage to prevent collections or haematoma formation, which would otherwise eventually lead to the extrusion of the implant.

Fig. 3. Reconstructed with SMI, and pectoralis major myocutaneous flap for the inner lining and Bakamjian flap for skin cover.

Fig. 4. Intraoral view, showing pectoralis major composite flap forming the floor of the mouth.

Fig. 5. Clinical result before division of Bakamjian flap.

Fig. 6. Late postoperative result. Patient totally rehabilitated with dentures.

Table 1. Primary reconstruction with silastic implant

		Cases Retained 1-5 yrs	Rejected before lyr
Flap for lining and skin cover	51	11 (21.5%)	40 (78.4%)
Flap for skin cover only	01	01 (100%)	-
Primary closure of mucosa and skin	15	08 (53.3%)	07 (46.6%)
Total cases	67	**20 (30%)**	**47 (70%)**
Pre-operative irradiation /chemotherapy	19	08 (42%)	11 (57.8%)
Middle 1/3-mandibulectomy	14	08 (57.1%)	06 (42.8%)
Extended resection of mandible & soft tissue	53	12 (22.6%)	42 (79.2%)

RESULTS

Sixty-nine patients who had undergone primary mandibular reconstruction with SMI following resection for cancer or ameloblastoma were followed up for a period of 1 to 10 years. In these series there were 2 deaths in the immediate postoperative period, one due to coronary ischaemia and the second from pulmonary infection and septicemia. In 47 cases the SMI was removed due to infection and fistula formation because of haematomas or salivary leaks, within a period of 3 weeks to 1 year. In 20 patients the SMI remained without any complication and with proper retention, for a period of 1 to 5 years.

In the 20 cases where the SMI were retained, 8 had primary closure of the skin and mucosa, 4 had pectoralis major myocutaneous flap for mucosal lining and deltopectoral flap for skin cover, 7 had bipaddled pectoralis major myocutaneous

flap and one had primary mucosal closure with a local flap for skin cover. In 47 cases where SMI were removed, 22 had bipaddled pectoralis major myocutaneous flap for replacement of skin and mucosa, 7 had primary closure of both skin and mucosa, 14 had deltopectoral flaps for skin cover and pectoralis major myocutaneous flap for mucosa, and 4 had deltopectoral flaps for skin cover with tongue flaps for mucosal lining. In these patients (where the SMI was removed), 16 had minor or major flap necrosis, one had a salivary fistula, 26 had minor infections, and 4 had major infections due to haematoma formation which required surgical intervention.

Out of the total 67 cases, 19 had received preoperative radio/chemotherapy. Eight out of these 19 had their SMI retained for more than one year. Twenty-four patients had excellent speech, while in 43 patients the speech was altered but legible. Forty-five patients could eat solids reasonably well, 22 could eat solids with difficulty. Twenty-five patients had a poor cosmetic result following the removal of SMI, while 22 had acceptable result. In 20 cases where the SMI was retained, the cosmetic result was good, including the retention of dentures which were provided after third postoperative week.

DISCUSSION

Extended resection of the middle third of the mandible, along with floor mouth excision and radical neck node dissection, is evaluated as an added burden in immediate mandibular reconstruction following ablative cancer surgery. Restoration of the mandibular arch especially with an added extensive tissue loss in the anterior floor-mouth region requires interpolated composite flaps to provide adequate cover to the skeletal reconstruction of resected mandible and the contour restoration. It remains the greatest reconstructive challenge for plastic surgeons. On the other hand elastic cheek mucosa and tongue allow comparatively easy reconstruction of defects at the body and ramus of the mandible.

The SMI serves the purpose of an immediate tissue spacer after extensive resection of the mandible. It offers a rigid skeletal support and provides an excellent contour even in cases with extensive lesions requiring major reconstructive procedures with different flaps, and having a high risk of postoperative infections. It also permits postoperative radiation as there is no backscattering of the rays. In 30% of cases in our series, SMI was retained for a period of one year to 5 year, which was considered as a successful result. Forty seven (70%) SMI were retained for a period of less than 1 year. Komisar et al. (4) reported complications in 9 of 11 patients who underwent reconstruction with plates. Complication rates as high as 80% have been reported with 50% resorption rate when free bone grafts were employed. All of their immediate reconstruction for carcinoma were associated with complications. Kruger & Krumholtz (5) reported a failure rate of 50% in immediate reconstruction with rib grafts and plates. The majority of the failures were due to infection or nonunion. In the group receiving the mesh tray, success rate reported was 44% by Lawson et al. (6).

In our series, preoperative chemotherapy or radiotherapy has not affected the rejection rate (57.8%) of SMI. High rejection rate of 78% was observed in cases where flap cover for both skin and mucosa was required due to extensive nature of reconstruction in advanced cases. In cases with extended resection of mandible and soft tissues also reflects the same high rejection rate of SMI, 79.2%. Whereas in cases with primary closure of skin and mucosa both, rejection rate observed was 46.6%. Flaps for mucosa lining and skin coverage did influence the complications or success rate. Extensive oral suture line provided the portal of entry for saliva, leading to more complication rate and SMI extrusion rate in this series.

If for any reason there is a postoperative infection, SMI can be very easily removed, ordinarily in the out-patient clinic, thus having a distinct advantage over immediate bone grafts, vascularised or nonvascularised. Even after its removal, specially if it has been retained for 4 to 6 weeks, there is formation of a thick fibrotic capsule which helps in retaining the facial configuration.

Thus the SMI is extremely useful in providing a temporary strut, retaining the normal contour and keeping the remaining mandibular fragments in alignment even in cases with a high risk of postoperative infection, without submitting the patient to a lengthy operative procedure with disastrous results if any infection or salivary leak occurs postoperatively. A secondary bone grafting may be offered to the patient at later date, which is then performed without opening the oral cavity, reducing postoperative complications.

CONCLUSION

The conclusion we came to is that the SMI is a useful tool in immediate mandibular reconstruction as it involves a simple procedure, reducing the operative time and stay in the hospital. In ideal cases, retention of the implant can be anticipated if proper care is taken to prevent postoperative infection or haematoma formation, and salivary leaks can be prevented by careful and adequate mucosal closure prior to the introduction of the implant.

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PROPHYLACTIC ANTIBIOTICS ADMINISTRATION HEAD AND NECK CANCER SURGERY WITH MAJOR FLAP RECONSTRUCTION: 1-DAY CEFOPERAZONE VERSUS 5-DAY CEFOTAXIME

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SUMMARY

Patients who undergo surgery of the head and neck cancer with major flap reconstruction, benefit from perioperative antibiotic prophylaxis. Head and neck surgery, especially ablative cancer surgery with major flap reconstruction is potentially contaminated iatrogenic wound, and the use of preoperative, perioperative and post operative chemoprophylaxis for infection is mandatory. This study is being done to determine if shorter course of antibiotic administration (Cefoperazone) would be more effective than conventional 5-day antibiotic administration (Cefotaxime). Patients who are identified as requiring major flap reconstruction after extensive ablative surgery for head and neck cancer, are considered as potential candidates for this study. The choice of ideal antibiotics and duration period are still under discussion.

Patients were assigned randomly to receive Cefoperazone sodium for either 24 hr. (study group) or Cefotaxime sodium for 120 hr. (control group). A total of fifty patients were studied. The incidence of wound infection, flap death and major complications are evaluated. Out of the fifty patients studied, twenty-eight were assigned to 1-day prophylaxis. Incidence of failure of prophylaxis (F. P.) was 7.1% in this group. Twenty-two patients were assigned to 5-day prophylaxis, in whom F. P. rate was 9.8%. This study suggests that, there is no beneficial effect from administration of antibiotics for more than 24 hr. postoperatively in patients two undergo major flap reconstruction for head and neck cancer after extensive radical ablation surgery.

ZUSAMMENFASSUNG

Das profylaktische Einnehmen der Antibiotika beim chirurgischen Eingriff im Falle des Kopf- und Halskrebs mit Rekonstruktion mithilfe des großen Lappens; eintägiges Einnehmen von Cefoperason gegenüber fünftägigem Einnehmen von Cefotaxim

H. M. Bhathena, N. M. Kavarana

Die Patienten, die sich dem operativen Eingriff des Kopf- und Halskrebs mithilfe der Rekonstruktion des großen Lappens unterziehen, profitieren von der perioperetiven Profylaktion der Antibiotika. Der chirurgische Eingriff im Kopf- und Halsgebiet, besonders die ablative Chirurgie des Krebs mit der Rekonstruktion mithilfe des großen Lappens führt potenzionell zu einer kontaminierten iatrogennen Wunde und Anwendung vor-, bei-, und pooperativer Chemoprofalaxion des Infekts ist ausreichend. Diese Studie wurde durchgeführt um festzustellen, ob kurzzeitiges Einnehmen der Antibiotika wirksamer wird (Cefaperason) als klassische fünftägige Behandlung mit Cefotaxim. Für diese Studie wurden die Patienten ausgewählt, bei denen nach einem ausgedehnten abiativen Eingriff wegen des Kopf- und Halskrebs die Rekonstruktion mithilfe des großen Lappens notwendig war. Über die Wahl des richtigen Antibiotikum wird immer noch diskutiert.

Die Patienten wurden durch die Randomisation für das Einnehmen von Cefoperasom nach 24 Stunden (Studiengruppe) oder Cefotaxim nach 120 Stunden (Kontrollgruppe) bestimmt. Insgesamt wurden in die Studie 50 Patienten eingereiht. Es wurden das Auftreten von Infektion, Absterben des Lappens und weitere ernshafte Komplikationen beobachtet. Von 50 beobachteten Patienten wurden 28 in die Gruppe des eintägigen Einnehmem der intensiven Profylaktion eingereiht. Das Versagen dieser Methode wurde bei 71% dieser Gruppe festgestellt. 22 Patienten wurden in die Gruppe des fünftägiges Einnehmen eingereiht. Der Mißerfolg der Profylaktion stellte 9,8% dar. Diese Studie setzt voraus, daß längere Anwendung der Antibiotika mehr als 24 Stunden postoperativ bei den Patienten, die sich einer abiativen Operation des Kopf- und Halskrebs mithilfe der Rekonstruktion des großen Lappens unterzogen haben, keine Bedeutung hat.

Key words: prophylactic antibiotics, major flap reconstruction, cefoperazone v/s cefotaxime

Head and neck cancer patients, who undergo major flap reconstruction after extensive ablative surgery with major flap reconstruction, benefit from perioperative antibiotic prophylaxis. This is the most crucial time when the maximum dislodgment and translocation of organisms take

place due to physical handling of the tissues. This study is being done to determine if shorter course of antibiotic administration (Cefoperazone) would be more effective than conventional 5-day administration (Cefotaxime). Patients who are identified as requiring major reconstruction are considered as potential candidates for this study.

Several clinical trials have demonstrated that antibiotic prophylaxis is mandatory in head and neck surgery, especially with major flap reconstruction after cancer ablation in these patients. The unacceptable wound infection rate (up to 78%) in clean, contaminated major head and neck cancer surgery was found in patients who were receiving placebo medicine (1, 3, 5). Intravenous antibiotic administration, the current Gold Standard of treatment, have established a marked reduction in postoperative wound infection in these patients. The benefit of antibiotic prophylaxis is measured in terms of reduced rate of wound infection. Research to date has shown that a third generation cephalosporine such as Cefoperazone or Cefotaxime may be equally effective in the prevention of postoperative wound infection (1, 3, 5, 6).

Studies have also indicated that 1-day perioperative antibiotic prophylaxis results in an incidence of wound infection that is not statistically different from the incidence of infection encountered when the antibiotic prophylaxis is administered for more prolonged periods of time (4, 7, 8, 10) Antibiotics employed perioperatively during contaminated surgical procedures sterilize the operative wound. The antibiotic prophylaxis is maximally useful when begun before the surgical contamination. At the completion of surgery, since there is no further contamination; no further antibiotics are needed (2). The most crucial time for these patients to receive antibiotics, is just before beginning of surgery and to maintain the level till the closure of the surgical wound is achieved. The soilage of the wound with saliva is the major source of infection for these patients. The complex anatomy of the upper aro-digestive tract leads to watertight closure difficult and adds into the problems due to salivary contamination.

Specifically patients with large fungating tumours in developing country like India, that undergo great quantum of resection need reconstruction with various flaps single or in combination; including pedicled flaps, interpolated flaps, composite flaps and free tissue transfer. Postoperative wound infection has been encountered more frequently in patients treated in this manner by extensive surgery. It is assumed that the increased incidence of postoperative wound infection in patients who undergo major flap reconstruction in head and neck cancer surgery is most likely a result of prolonged contamination of the wound by saliva (2, 9). Continued salivary contamination of the wound may occur because of factors; such as movement, tight sutures, inadequately placed sutures or ischemia of the suture line. Complex 3-dimensional anatomy of the upper aero-digestive tract makes watertight closure difficult and may result in salivary leakage in the operative wound (7, 11). These patients therefore represent an ideal group to test the efficacy of a single day perioperative antibiotic (Cefoperazone) as compared to prolonged administration of antibiotic (Cefotaxime).

Intravenous administration of antibiotics represents the current standard of treatment leading to significant reduction of wound infection rate. Nevertheless, there is no unanimous agreement as to drugs of choice and optimal duration of antibiotic prophylaxis (10). This study was undertaken to compare the efficacy of 1-day versus 5-day course of antibiotics in the prevention of postoperative wound infection. A prospective randomized double blind study was undertaken.

MATERIALS AND METHODS

Selection Criteria

Head and neck cancer patients who were identified perioperatively requiring major flap reconstruction, in which clean contaminated wounds were created, were selected as candidates for this study. Any clean surgery wound in the head and neck region which opens the aero-digestive tract causing soiling with salivary secretions, is defined as clean- contaminated wound. Oral carcinoma staged preoperatively as T_{1-4}, N_{0-2b}, M_0, were included in this study. Most of these patients were T_4 advanced fungating lesions which were potentially infected cases, with extensive involvement of skin and buccal mucosa. Hence after ablative surgery, they required one or more than one skin or composite flaps to reconstruct the defects. All oral cancers involving buccal mucosa, alveolus, floor of mouth and retromolar trigone were included. Patients with associated systemic problems such as diabetes mellitus, hypertension were also included in the study.

Lesions involving base tongue, maxilla, upper alveolus were not included for this study. Cancers of the hypopharynx, pharynx, larynx and patients who had received radiotherapy, chemotherapy have not been included.

After informed consent obtained, patients were assigned randomly to receive Cefoperazone Sodium 2 gm intravenously, 12 hrly for three doses (study group) or Cefotaxime Sodium 1 gm intravenously, 8 hrly for 120 hr. (control group), starting 1 hour before the onset of surgery. Fifty patients were studied. 28 patients were assigned to 1-day prophylaxis, of which 15(1A) were reconstructed with single composite flap (Pectoralis major myocutaneous flap-PMMC) and 13(1B) were reconstructed with double flaps (PMMC and delto-pectoral skin flaps). Twenty-two were assigned to 5 days chemotherapy, of which 14(2A) were reconstructed with single composite flap (Pectoralis major myocutaneous flap-PMMC) and

8(2B) were reconstructed with double flaps (PMMC and delto-pectoral skin flaps). (Table-1). Other drugs started simultaneously in study and control groups were; Gentamycin 60 mgm and Metronidazole 100 ml intravenously 8 hrly for 3 days and 5 days respectively.

Table 1. Patient profile according to duration of therapy and method of reconstruction.

Duration of antibiotics	Single flap	Double flap	Total
Cefoperazone Cefotaxime	15 [1A] 14 [2A]	13 [1B] 8 [2B]	28 22
Total	29	21	50

Grading of infection

All patients were observed at interval of 48 hr. by a non-biased surgical team. The status of the postoperative wound was noted on a scale of 0 to 5.

0 - Normal healing
1 - Erythema < 1 cm.
2 - Erythema 1-5 cm.
3 - Erythema > 5 cm and induration.
4 - Frank pus
5 - Orocutaneous fistula

Patients graded 4 and above were considered to have postoperative wound infection.

Flap viability

Flap viability was also graded on the following scale-

0 - Normal appearance
1 - Superficial necrosis
2 - Partial flap necrosis
3 - Total flap necrosis

End points of the study

1 - Infection grade 4 or more
2 - Ischaemic death of the flap (flap grade 3 or more)
3 - Wound completely healed.

RESULTS

Failure of prophylaxis

We are of the opinion that the eventual late complications of the surgical wound can not be attributed to the failure of the prophylactic antibiotic. Prophylactic antibiotics administration should be able to take care of the commonly found pathogens of the oral cavity. Therefore, only wound infections occurring during the first 5 days of surgery were recorded as failure of prophylaxis (Table - 2 to 4).

Table 2. Infections encountered according to duration of surgery.

Duration of prophylaxis	Cases	Infections encountered	%	Flap necrosis	%
1-Day	28	3	10.71	1	3.57
5-Day	22	5	22.72	3	13.63

Table 3. Failure of Prophylaxis [F. P.]

Group	No. of F. P./No. of patients	Percentage
1A	1/15	6.60
2A	1/14	7.14
1B	1/13	7.69
2B	1/8	12.50

Table 4. Systemic Infections

Group	Pulmonary Infections	Urinary Infections
1A	Nil	Nil
2A	2	1
1B	Nil	Nil
2B	Nil	Nil

Bacteriology

Patients were assigned at random to receive the antibiotics. Oral swabs were taken on postop day 2 and day 5 for documentation and antibiotic sensitivity (Table 5).

Table 5. No. of patients and nature of flora

	Study Arm		Control Arm	
	Day-2	Day-5	Day-2	Day-5
Pseudomonas	5	11	9	14
Klebsiella	2	3	-	1
Acinobacter	9	10	5	3
Enterobacter	11	1	2	2
Proteus	1	3	2	-
No Growth	-	-	2	2

DISCUSSION

Postoperative wound infections in head and neck oncologic surgery result from the contamination of surgical wounds by saliva during surgery. This contamination is directly related to the prolonged duration of surgery especially if they have undergone flap reconstruction (9, 13). It also depend upon the initial condition of the lesion, and the extent of excision and type of reconstruction surgery. Fungating advanced lesions are having more po-

tential of perioperative contamination and infection due to dislodgment and translocation of the organisms during the surgery. Hence, the perioperative time is the most crucial time during which translocation of the organisms should be controlled by systemic antibiotics.

It is a well known fact that the control patients receiving placebo have an unacceptable wound infection rate in the postoperative period. In common surgical practice, antibiotic prophylaxis is administered for 5 days. However, clinical trials have shown that antibiotic prophylaxis administered for more than 24 hr. after surgery does not offer significant advantages in reducing the postoperative wound infection rate (4, 7).

Fifty patients underwent single or double flap reconstruction for advanced head and neck cancer. The method of reconstruction was pectoralis major myocutaneous flap either alone or in combination with deltopectoral flap. The patient profile according to the duration of antibiotic prophylaxis and the method of reconstruction is shown in Table 1.

Twenty eight patients received Cefoperazone as 1 day prophylaxis (1A and 1B). Three of them developed wound infection grade of more than 3 resulting in a wound infection rate of 10.71%. One out of these three patients developed flap necrosis (Table 2). Twenty two patients received Cefotaxime as 5 day prophylaxis (2A and 2B). Out of them, 5 patients showed signs of infection which was graded more than 3. This group therefore, showed wound infection rate of 22.71%. However, three of these 5 patients had flap viability grade of more than 2 i.e. flap necrosis (Table 2). Patients in whom flaps necrosed, the wound infection was considered to be resulted from flap necrosis therefore, we think that they should not be considered as Failure of Prophylaxis. According to us, to quality for „Failure of Prophylaxis" (F. P.), the wound infection should occur within the first 5 days of surgery with viable flaps. Infections that occur later in the postoperative period are related to the other factors of wound healing such as ischaemia of suture line, poor nutrition etc. The early postoperative wound infections are more likely to represent failure of the postoperative antibiotics than are the late wound infections. Table 3 shows the number of patients with F. P. and its percentage. The percentage of F. P. increases as one proceeds from 1A to 2B. Moreover, it is apparent that the percentage of F. P. is less in the Cefoperazone administered groups (1A and 1B) than the Cefotaxime administered groups (2A and 2B). Therefore, 1 day prophylaxis with Cefoperazone is equally, if not more, effective in controlling the wound infections.

It is argued that the 5 day administration of antibiotics is superior to 1 day prophylaxis in controlling the systemic infections. Our study shows that 1 day prophylaxis is effective in preventing the systemic infections. Actually, the three patients in whom systemic infections developed belonged to the control group (2A and 2B).

The most common organisms isolated from the oral swabs were Pseudomonas, Acinobacter and Enterobacter. Klebsiella and Proteus were isolated less frequently. Studies involving the antibiotic sensitivity showed no significant differences between Cefoperazone and Cefotaxime (Table 5).

Conclusion

Out of the fifty patients studied, twenty-eight were assigned to 1-day prophylaxis. Incidence of failure of prophylaxis (F. P.) was 7.1% in this group. Twenty-two patients were assigned to 5-day prophylaxis, in whom F. P. rate was 9.8%. This study suggests that there is no beneficial effect from administration of antibiotics for more than 24 hr. postoperatively in patients who undergo extensive reconstruction for head and neck cancer after radical ablation surgery. In spite of longer duration of surgery and consequent greater exposure of tissues to saliva in patients undergoing major flap reconstruction; wound infection rate is lower in the 1-day prophylaxis group. Hence, 1-day Cefoperazone administration is as effective as 5-day Cefotaxime administration in reducing the number of cases with Failure of Prophylaxis and in preventing systemic infections.

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RECONSTRUCTION OF PARALYSED BICEPS BRACHII MUSCLE BY TRANSPOSITION OF PEDICLED LATISSIMUS DORSI MUSCLE: REPORT OF TWO CASES

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SUMMARY

The biceps brachii muscle was reconstructed in two patients with inveterate injuries of the brachial plexus. The latissimus dorsi muscle was transferred on the thoracodorsal neurovascular bundle into the regio brachii anterior and sutured to the long head of the m. biceps brachii. The distal part of the latissimus dorsi muscle was sutured above the tuberositas radii along with the insertion tendon of the biceps brachii muscle. Both patients achieved very satisfactory restoration of flexion in the elbow joint 12 and 16 months after surgery.

ZUSAMMENFASSUNG

die Rekonstruktion des paralysierten Biceps brachii mit der Transposition des pedicled latissimus dorsi Muskel. Bericht über zwei Fälle.

P. Haninec, V. Smrčka

M. biceps brachii wurde bei zwei Patienten mit der veralteten Verletzung Plexus brachialis rekonstruiert. M. latissimus dorsi wurde auf das thorakodoarsalen Adernervenband in regio brachii anterior transponiert und auf den langen Kopf m. biceps brachii angenäht. Der distale Teil m. latissimus dorsi wurde über tuberositas radii mit der Rankensehne des m. biceps brachii zugenäht. Die beiden Patienten erreichten nach 12 - 16 Monaten nach der Operation eine sehr gute Flexion des Ellbogengelenkes

Key words: biceps brachii muscle, latissimus dorsi muscle, brachial plexus, transposition, reconstruction

Treatment of a paralysed biceps brachii muscle can be approached in several ways. If the reconstruction is performed in time - i.e., within approximately one year in the case of infraclavicular lesions of the brachial plexus and within half a year in the case of avulsions of roots C5, C6 (Akasaka et al. 1991, Kline 1991, 1995) - either the affected nerve can be sutured or reinnervation from other motor nerves can be attemmpted (Narakas 1981, 1988, Narakas and Bonnard 1995, Samardzic et al. 1992, Haninec et al. 1997). If, however, the operation is not performed within this interval, or if a severe myogenic lesion of the biceps brachii muscle is involved, it is possible to replace the paralysed biceps brachii muscle with another muscle with a preserved biceps brachii muscle with another muscle with a preserved neurovascular supply, e.g. the latissimus dorsi muscle (Akasaka et al. 1991, Berger et al. 1994, Hirayama et al. 1994).

CLINICAL MATERIAL, METHOD AND RESULTS

A male patient with an injury of the brachial plexus of the upper type was admitted to our department two years after his injury. Electrophysiological examination revealed complete denervation syndrome in the deltoid and biceps brachii muscles. The muscle strength of the two muscles was zero. Because of the delay, reinnervation by the n. musculocutaneous was no longer possible.

A female patient 20 months after a rotational injury of the right arm and the reconstruction of a fractured humerus. There was complete denervation syndrome of the infraclavicular portion of the brachial plexus. The patient underwent surgery in another department four months after the injury. The median and ulnar nerves were sutured, and severe damage to the biceps brachii muscle was observed. After the operation, grad-

ual reinnervation appeared in the reconstructed nerves and also spontaneously in the axillary nerve. Complete denervation syndrome of the radial and musculocuteneous nerves persisted.

In both patients, reconstruction of the biceps brachii muscle was indicated by means of a transfer of the latissimus dorsi muscle with an intact neurovascular supply. Under general anaesthesia the pars infraclavicularis of the brachial plexus was dissected in both patients. Preoperative stimulation confirmed complete denervation syndrome of the musculocutaneous and axillary nerves in patient 1. In patient 2 the musculocutaneous nerve was ruptured, and there was a major defect in the median and proximal part of the biceps muscle. On stimulation of the axillary nerve there was a satisfactory response in the deltoid muscle. We found the proximal stump of the radial nerve, which was ruptured close to its origin from the posterior fascicle. The distal stump could not be found, not even deep between the atrophic heads of the triceps brachii muscle. The operation was divided into three stages: 1. The neurovascular hilus of the latissimus dorsi muscle was dissected. The vasa thoracodorsalis and n. thoracodorsalis were loosened and freed along their entire course. 2. The pars vertebralis was dissected along with a major portion of the pars iliocostalis of the latissuimus dorsi muscle so that the total length of the muscle corresponded to the distance between the processus coracoideus and the tuberositas radii. Then the muscle was dissected and freed (Fig. 1). 3. The muscle was transferred with an intact neurovascular supply to the anterior portion of the arm. Its insertion tendon was sutured to the tendon of the caput longum of the biceps brachii muscle. The muscle was tubed, and its distal part with sutured along with the insertion tendon of the biceps brachii muscle just above the tuberositas radii (Fig. 2). For evaluation of the results the authors used the muscle test (British Medical Research Council) with a scale of 0 - 5 (Kline and Hudson, 1995).

The postoperative recovery in both patients was free from complications. The rehabilitation

Fig. 1. Freeing a flap of the latissimus dorsi muscle with a preserved neurovascular supply.

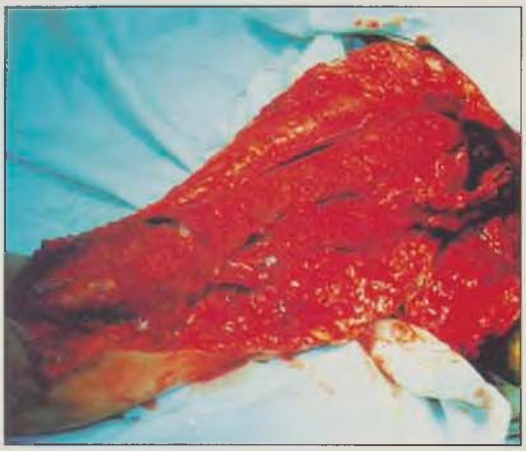

Fig. 2. Suture of the insertion tendon of the latissimus dorsi muscle to the tendon of the caput longum of the biceps brachii muscle, the muscle flap was tubed and sutured of the muscular flap and fixation to the insertion of the biceps brachii muscle above the tuberositas radii.

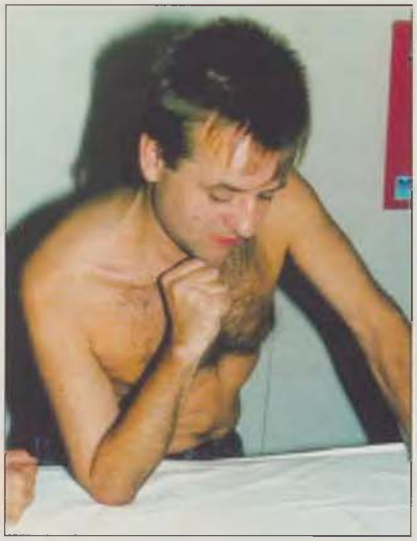

Fig. 3. Rehabilitation programme during the first three months after surgery with elimination of gravitation.

4a)
←

programme was divided into two periods: 1. During the first three months, exercise without gravitation was performed. 2. After the third month, the range of movement was increased to extension, flexion of more than 90 degrees and against gravity (Fig. 3). Five months after surgery, satisfactory flexion in the elbow joint was noted in both patients: 90 - 120 degrees. The muscle strength was 3. Their condition remained unchanged 12 and 16 months following surgery (Fig. 4).

DISCUSSION

In the case of avulsion of the roots in the region of the brachiae plexus, the primary therapeutic method is a reconstruction - reinnervation operation. During these operations, functionally important primary or secondary fascicles of the brachial plexus, the roots of which were damaged by injury, are sutured with nerves or nerve roots from less important areas. Thus it is possible to transfer root C4 (beneath the insertion of the phrenic nerve) as well as the root of C3 to the functionally important roots C5 and C6. This can be done by grafting or direct suturing of the distal stump of the affected root or primary fascicle with the donor root. Another method makes it possible to reinnervate the musculocutaneous nerve and axillary nerve by means of other intact motor nerves (intercostal nerves, accessory nerve, long thoracic nerve, thoracodorsal nerve, muscular nerves of the cervical plexus, the phrenic nerve and pectoral nerves). Also, the contralateral root of C7 can be used as a graft for the reinnervation of some nerves (Chuang et al., 1993a). The success of these very demanding operations is, according to Friedman's analysis of the literature (1991), about 50%. Samardzic et al. (1992) report 56 - 65% success, while Narakas and Bonnard (1995) report 57% success using the intercostal nerves and 75% when using the accessory nerve cervical motor branches (the patients had 2+ mobility according to the muscle test). The effectiveness of reinnervation operations when the phrenic nerve was used was 84.6% in 164 patients (Gu et al., 1990; Gu and Ma, 1996). The disadvantage of all these methods is that mobility of the upper extremity is only partially restored and that a relatively large percentage of the operations are unsuccessful. The prerequisite for success is to identify patients for surgery within 6 months after injury (Akasaka et al., 1991).

4b) →

Fig. 4. Active range of movement 12 months after surgery. A. onset of movement, B. active flexion against gravity at muscle strength 3.

Another method of choice is the transplant of muscle grafts with a preserved neuromuscular pedicle into the affected area. This method is usually reserved for inveterate injuries of the brachial plexus where reinnervation is impossible due to fibrous changes in the muscle. It is also possible to restore flexion in the elbow joint, e.g. by transplanting the latissimus dorsi muscle to the site of the denervated or damaged biceps brachii muscle (Kubáček et al., 1987; Akasaka et al., 1991; Hirayama et al., 1994). The condition can also be resolved by free transfer (e.g. of the m. gracilis) and use of a suitable motor nerve - e.g. the intercostal nerves, the accessory nerve, or some less important branches of the plexus brachialis (Doi et al., 1991, 1995). When it is necessary to use a graft, these nerves can be sutured initially to a vascularised graft from the ulnar nerve (in the case of a complete lesion of the brachial plaxus - Becker et al., 1993). As a source of motor fibres the contralateral root C7 was also used, to which a graft was sutured (Chuang et al., 1993a,b; Chuang, 1995). In the second stage, after 11 to 20 months, a free muscle graft was transplanted into the affected extremity of these patients, the nerve of which was sutured to the nerve graft. In general, these operations can be performed either in one stage, if nerve grafts need not be used, or in two stages, when it is necessary to suture grafts to the nerves that are donors of motor fibres. In this case, the sources of motor fibres are sutured to the grafts in the first stage, and in the second stage the distal portions of the grafts are connected with the nerve of the just-transplanted muscle graft. At the same time a vascular anastomosis is made. The interval between the first and second stages depends on the presence of motor nerve fibres in the distal stump of the nerve graft. Depending on the length of the graft used, this period is 6 to 20 months.

The deltoid muscle can be reconstructed by transposition of the upper (pars clavicularis) part of the pectorealis major muscle or the upper part of the trapezius muscle to the site of insertion of the deltoid muscle (Čihák and Eislt, 1962; Hou and Tai, 1991).

Chuang et al. (1993b), based on a group of 167 patients with injuries of the brachial plexus

treated either by reconstructive nerve operations (128 patients) or transplant of tendons or muscles (39 patients) conclude that: 1. The results of nerve reconstruction are better than the results of tendon or muscle transplantation. 2. Direct nerve suture is better than nerve transplants. 3. The results when using short nerve grafts (shorter than 10 cm) are better than the results when using long grafts (longer than 10 cm). 4. Reconstruction of infraclavicular injuries is more successful than reconstruction of supraclavicular injuries. 5. Vascularized nerve grafts are better than classical free nerve grafts. 6. Injuries of the brachial plexus in which its infraglanglionic parts are ruptured regenerate better after connecting operations than do avulsions of the brachial plexus after reinnervation operations.

The authors assume that in correctly-diagnosed patients, the transplantation of the latissimus dorsi muscle with an intact neurovascular supply is a suitable method for restoring flexion in the elbow joint.

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INVETERATE LESIONS OF THE COLLATERAL LIGAMENTS OF THE THUMB JOINTS

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SUMMARY

Inveterate lesions 2-18 months following injury to the collateral ligaments of the metacarpophalangeal (MP) joint of the thumb and pollicised proximal interphalangeal (PIP) joint were replaced by a tendinous transplant from the palmaris longus muscle.

The group comprised three patients, 34-46 years old, with a post-traumatic injury of the ulnar collateral ligament of the MP joint of the thumb and a seven-year-old child with an congenital defect of the radial collateral ligament.

Lateral 30-degree instability indicates injury of the collateral ligament. On examination the range of instability in the investigated group was between 45 and 90 degrees. The authors recommend comparison with the contralateral thumb.

ZUSAMMENFASSUNG

Die veralteten Beschädigungen der kolateralen Liggamentum bei Daumengelenken

V. Smrčka, R. Pluhařova

Die veralteten Beschädigungen 2-18 Monaten nach der Verletzung der Kolateralen Liggamentum des metakarpophalangealen (MP) Daumengelenkes und des proximalen interphalangealen (PIP) des Daumen Gelenkes wurden mit Sehnetransplantat aus m. palmaris longus ersetzt.

In der Gruppe waren 4 Patienten (34-46 Jahre alt) mit posttraumatischer Beschädigung des ulnaren kolateralen Ligamentum MP des Daumengelenkes und ein 7-jähriges Kind mit angeborener Beschädigung des radialen kolateralen Ligamentum.

Die laterale Unbeständigkeit 30 Grad setzt die Beschädigung des kolateralen Ligmentum voraus. Bei der Untersuchung befand sich in unserer Zusammenfassung das Unbeständigkeitausmaß von 45 bis 90 Grad. Wir empfehlen Vergleich mit dem anderen gesunden Daumen.

Key words: hand, collateral ligaments

For thumb function, stability of the joints is essential, in which the configuration of the articular surfaces, volar plates and collateral ligaments participate.

If the thumb joint can be deviated by more than 30 degrees, with the metacarpal bone fixed, an injury of the collateral ligaments may be assumed. For acute injuries of the ulnar collateral ligament (UCL), the term „skier's thumb" is used. The typical mechanism of injury involves a sharp impact of the ulnar side of the thumb against the ski pole while the wrist is suspended in the strap.

The patient is unable to hold a glass of water or turn a key; rotating movements of the thumb are impossible. The basic functional unit of the thumb together with the second and third three-phalangeal fingers is impaired (Fig. 1, 8).

Fig. 1. Patient M. V. with injury of the ulnar collateral ligament (UCL), unable to hold an object between thumb and index finger.

MATERIAL AND METHODS

The authors' group of four patients was comprised of three lesions of the collateral thumb ligaments after injury and, in one instance, a ligamentous lesion associated with a congenital defect.

Patient M. V., 42 years old with a lesion of the ulnar collateral ligament of the metacarpophalangeal (MP) joint of the right thumb after a fall and unsuccessful two-month nonsurgical treatment, came for an examination in the spring of 1996. Radial laxity was found in the MP joint of the thumb with lateral deviation up to 45 degrees. After reconstruction of the ligament on March 20, 1996, the patient developed patchy Sudeck's porosis of the metacarpal head in June 1996. The condition was restored to normal after anti-osteoporotic treatment and rehabilitation. One and a half years later, in September 1997, the functional state is comparable with that of the contralateral thumb.

Patient D. H., 46 years old with a lesion of the ulnar collateral ligament after a motor accident on 15 October 1994 and unsuccessful surgical treatment in another department (reconstruction from the remains of the ligament and articular capsule). On examination the right thumb was so labile in the MP joint that it could be deviated as far as 90 degrees. On 27 February 1996 the authors reconstructed the ligament. On 4 November 1996 protective splinting was ended. After one and a half years, function is comparable to that of the contralateral thumb.

Patient D. R., 34 years old, suffered an injury while operating a grinder. The authors revascularized the partially-amputated right hand in the area of the metacarpal bones and MP of the thumb joint with the amputate suspended on the flexor tendons. Further operations followed: on 13 September 1995 a bone graft into the second metacarpal bone and reconstruction of the extensor of the thumb, on 28 February 1996 implantation of a silicone tendon instead of the thumb flexor, using a flap to cover the first interdigital space. On 19 August 1996 the silicone tendon was replaced by a tendon prosthesis from the palmaris longus muscle; on 18 March 1997 the authors reconstructed the ulnar collateral ligament. In October 1997 the patient took his European welders examination with a reconstructed hand. The hand is fully functional.

Patient M. K., 7 years old, was treated in other departments for polydactyly and amniotic stricture syndrome. On the right, six-fingered hand, a hypotrophic thumb was amputated during the first year of life, and a three-phalangeal finger in close contact with the hypotrophic thumb was pollicised.

During the patient's first visit it was found that the three-phalangeal finger replacing the thumb could not fulfill its function because of a constant 80-degree flexion in the proximal interphalangeal joint (PIP) in the ulnar direction, due to loosening of the radial collateral ligament (RCL). The authors reconstructed the ligament on 27 August 1997 in a similar manner as the MP thumb joint. At the same time it was necessary to perform an osteotomy in the neck of the basic phalanx with rotation of the head.

In October 1997 the function of the PIP in the three-phalangeal pollicised finger is satisfactory; only a subtle 5-10 degree ulnar deviation persists, associated with the different configuration of the three-phalangeal finger as compared to the thumb.

Fig. 2. Disrupted collateral ligament.

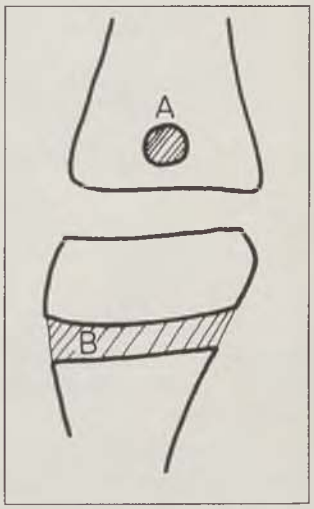

Fig. 3. Holes in bones are in planes at right angles to each other.

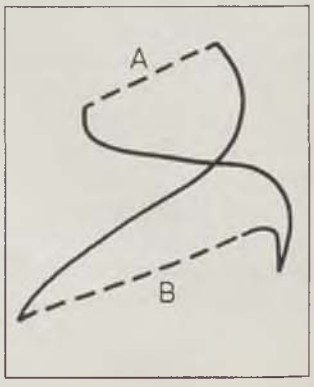

Fig. 4. Tendinous transplant in the shape of a figure 8, crossing at the site of the original collateral ligament.

Fig. 5. Splint fixing the MP joint, suitable even in the case of oedema of soft tissues, in particular in postoperative osteoporosis (patient M. V.).

Fig. 6. Positioning splint preventing excessive abduction. Patient D. H. used this splint while performing laboratory work, patient M. V. while working as an anaesthesia nurse.

Fig. 7. Restored grip after reconstruction of UCL in patient M. V.

Fig. 8. Instability of MP joint on examination of UCL lesion in patient D. R.

Fig. 9. Patient D. R. with a firm grip following UCL surgery.

In all four patients the reconstruction of the disrupted collateral ligament (Fig. 2) was made by means of a tendon graft taken from the palmaris longus muscle. The grafted tendon, in order to replace the collateral ligament, is folded into a figure-eight shape (Fig. 4), crossing at the site of the original collateral ligament. The margin of the transplant is fixed on the proximal side of the ulnar surface of the joint. The openings in the metacarpal bone and basic phalanx of the thumb A, B through which the tendon transplant passes are in planes at right angles to one another to prevent volar subluxation (Fig. 3). Reconstruction of the radial collateral ligament was made in a similar way but with a mirror-image fixed transplant. A similar procedure was used in the PIP joint of the pollicised three-phalangeal finger and in the MP joint of the thumb because of the similarity of the two joints (Dray, Eaton, 1993).

Following surgery the MP joint is fixed by a plaster splint. From the second day the thumb flexor is actively exercised by movement in the IP joint. After regression of the postoperative oedema, the plaster splint is replaced by a plastic one. The latter must not permit lateral movements in the MP joint. The plastic splint is left on for 8-12 weeks and is removed only for exercising. Subsequently, it is removed for 30-minute intervals. From the 8th week onwards flexion in the

MP joint was also started; from the 10th to the12th week, movement was intensified by exercising the grip around a 6-8 cm cylinder. From the 12th week onwards unrestricted movement was already permitted. For a period of 2-3 months the patients wore the protective splint continuously, and up to six months during more demanding activities and during the night. During sporting activities the MP joint was taped.

RESULTS AND DISCUSSION

In all four patients with inveterate lesions of the ligaments, stability of the joints was ensured in the same way - by a tendinous transplant from the palmaris longus muscle. In three cases a reconstruction of the ulnar collateral ligament of the MP joint of the thumb was made. In one case was performed a reconstruction of a radial collateral ligament of the PIP joint of a three-phalangeal finger, which replaces the thumb in patient M. K. who suffered from polydactyly. In patients with a reconstructed ulnar collateral ligament, function comparable with the collateral thumb was restored. The result was evaluated during a follow-up examination one and a half years later. In the fourth patient with an inborn defect and simultaneous osteotomy of the head of the phalanx, in order to improve the position of the finger in opposition, and with a reconstruction of the radial collateral ligament, occured a slight deviation of the joint axis by 5-10 degrees in an ulnar direction, due to the configuration of the joint. In terms of function, the movement in the joint three months after surgery is satisfactory.

Chronic lesions of the ulnar collateral ligament were treated by: 1. reconstruction from the remains of the capsule (Isani 1986), 2. a shift of the thumb adductor from its insertion on the ulnar sesamoid bone to the ulnar side of the base of the proximal phalanx (Green 1990), 3. a static tendinous transposition leaving the tendon used for replacement of the ligament connected at the distal end (Sakellarides, 1984), 4. desis of the joint (Frank, Dobyns, 1972), 5. a tendinous transplant (Frykman and Johansson, 1956; Sennwald et al., 1987).

The group treated by the authors is too small to permit evaluation of which technique is more suitable for the reconstruction of collateral ligaments. The authors feel, however, that long-term splinting, as was done in one of the patients (M. V:), is unnecessary in inveterate lesions. It can be assumed that, as published by Stener (1962), in complete acute ruptures aponeurosis of the adductor is interposed between the ruptured ligament and its insertion at the base of the proximal phalanx. In these cases healing cannot be achieved by a conservative method and the lesion must be treated surgically. In patient D. H., before our surgery involving a grafted tendon, the ligament was reconstructed from residues of the collateral ligament and part of the articular capsule. This type of reconstructed ligament did not hold up to the work load. During preoperative examinations, the range of instability in collateral ligament injuries in our group of patients varied between 45 and 90 degrees.

CONCLUSION

If there is 30-degree instability in a radial direction with the metacarpal bone fixed, it is assumed that the ulnar collateral ligament is affected; when the instability is 20 degrees, the radial ligament of the MP joint of the thumb is assumed to be affected. However, the mobility of the MP joint must always be compared with that of the contralateral sound thumb while fixing the metacarpal bone; if the finding is not clear, an examination using a wrist or local block should be made. The clinical diagnosis is also supported by local tenderness or by possible induration in the area of the affected ligament.

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CRANIOFACIAL ABNORMALITIES IN SLEEP APNOEA SYNDROME

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SUMMARY

One hundred and four men with the suspected diagnosis of sleep apnoea syndrome (SAS) not suffering from neuromuscular diseases or acromegaly were examined by X-ray cephalometry. Subjects suffering from bronchial obstruction, laryngeal carcinoma, suspected Treacher Collins syndrome as well as subjects in whom SAS was not verified were excluded. The remaining 81 men were divided into two groups depending upon disease severity as expressed by the mean index of oxygen desaturations per hour (less than 30 - group A; more than 30 - group B). In group B, the following parameters were significantly altered as compared with group A: dorsocaudal rotation of the mandible, elongation of the soft palate, and an increase of the saddle angle, increase of the angle of the cranial base, the lower gonion angle and the angle of the inclination of the mandible.

Differences in the size of the soft palate, the rotation of the mandible and the size of the lower gonion angle can be found not only between healthy and subjects with SAS but also between subjects with mild and severe apnoea.

ZUSAMMENFASSUNG

Kraniofaciale Abnormalität bei dem Schlafapnoesyndrom

S. Dostálová, Z. Šmahel, K. Šonka

104 Manner mit dem Verdacht an einem Schlafapnoesyndrom, ohne Behandlung wegen der Akromegalie, haben sich einer rontgenenzephalometrischen Untersuchung unterzogen. Nach der Ausschliessung der an bronchialer Obstruktion (chronische obstruktive Bronchitis) und an neuromuskularen Erkrankugen leidenden Kranken, und der Patienten ohne das nachgewiesene Schlafapnoesyndrom, wurden die restlichen 81 Manner in zwei Gruppen unterteilt, jenach der Schwere der Erkrankung gewertet anhand des durschnittlichen halbstundligen Indexes der Saurstoffedesaturation (Gruppe A - unter 30, Gruppe B - uber 30). Gegenuber der Gruppe B waren in der Gruppe A die folgenden Parameter signifikant geandert; dorsokaudale Rotation der Mandibula, Verlangerung des wiechen Gaumens, Vergrosserung des sellaren Winkels, des Winkels der cranialen Basis, des unteren Teiles des gonialen Winkels der Unterkieferneigung. Die Unterschiede in der Grosse des weichen Gaumens, in der Rotation der Mandibula und in der Grosse des weichen Gaumens, in der Rotation der mandibula und in der Grosse des unteren Teiles des gonialen Winkels darf daher nicht nur bei der gesunden Bevolgerung ermittelt werden, sondern auch bei den Patienten, die an das schwere und leichte Schlafapnoesyndrom leiden.

Key words: cephalometry, craniofacial abnormality, sleep apnoea syndrome

Sleep apnoea syndrome (SAS) is a set of symptoms caused by pathological respiration during sleep. Regular breathing is interrupted by pauses caused by repeated occlusion of the upper airways during sleep. Frequent respiratory arrests during sleep lead to sleep fragmentation, episodes of hypoxaemia and changes of intrathoracic pressure (3, 13).

The basic manifestation of SAS are apnoeas and hypopnoeas (10 seconds or longer). The criterion for establishing a diagnosis of SAS is five or more apnoeas or hypopnoeas per hour. Apnoeas may be peripheral (also called obstructive), central or mixed. During the substantially more frequent obstructive apnoeas, respiratory movements persist. During central apnoeas respiratory efforts are absent. A brief awakening terminates apnoeas. Therefore the sleep of patients with SAS is fragmented, and thus the duration of delta (NREM 3 and 4 sleep) and paradoxical sleep (REM sleep) is usually reduced.

During the night the patient usually snores; the snoring has an intermittent character. In the morning the patients feel sleepy and tired; they suffer from headaches, and their oral mucosae are dry. During the day the patients are tired, suffer from an impaired concentration is reduced. The dominating daytime symptom is excessive sleepiness due to the poor quality of night sleep.

Complications of SAS are hypertension, cor pulmonale, systemic hypertension, ischaemic heart disease, impaired cardiac rhythm and myocardial infarction (6, 7, 8). SAS affects both the quality and the length of life (9).

Impaired patency of the upper airways during obstructive apnoea intervals develops as a result of soft tissue collapse in the pharynx. The collapse of the upper airways is exacerbated by anatomical narrowing (2), a reduced pharyngeal muscles tension and worsened synkinesis of the diaphragm and pharyngeal muscles during 1 and 2 NREM sleep. Complete obstruction develops when the forces leading to occlusion are stronger than those preventing it (10).

Craniofacial abnormalities which predispose to pharyngeal obstruction can be detected by cephalometry. Cephalometry assesses the shape and size of the orofacial skeleton, the size of the uvula and the shape of the upper airways by analysis of long-distance x-ray pictures of the head. The aim of the present work is to evaluate the usefulness of measuring different cephalometric parameters for the diagnosis and assessment of SAS severity in men.

METHOD

CEPHALOMETRY

During the procedure the cephalometric technique of Riley at al. (11) was used: the patients sat in a lateral position at an angle of exactly 90° to the apparatus; they looked straight ahead and had a centric occlusion. The patients were instructed to relax the tongue on the floor of the mouth and to avoid swallowing. A constant distance from X-ray source to the median plane of the head was 220 cm. The distance of the median plane of the head from the film, „X", was between 24 and 36 cm. The magnification („M") calculated by the formula (M = 100X/220) was 11 to 16%. Thus, for all practical purposes, correction for the enlargement of linear dimensions measured in pictures taken with the same apparatus is not needed (1, 14).

Figure 1 show thirteen x-ray cephalometric points indicated on each picture (1, 4, 11, 14, 15). Following angles evaluating the skeleton were measured: the angle of the cranial base (N-S-BA) (1); the angle of the inclination of the mandible (N-GO-GN); the articular angle (S-AR-GO) (15); the position of the upper and lower jaws (SNA, SNB); the angle classifying sagittal maxillo-mandibular relations (ANB) (1); angles characterising the inclination of the maxilla, the body of the mandible and vertical maxillo-mandibular relations (NSL/NL, NSL/ML, ML/NL) (1); the saddle angle (N-S-AR); the gonion angle and the lower gonion angle (AR-GO-ME, N-GO-ME) (4). Following skeletal dimensions were measured: the length of the anterior part of the cranial base (S-N); the depth of bony framework of the nasopharynx (BA-PNS) (1); the overall length of the

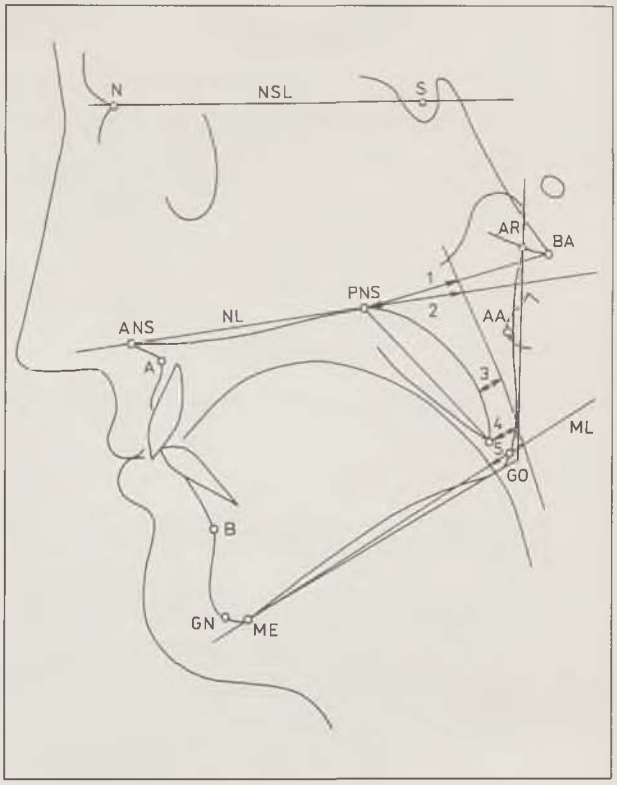

Fig. 1. Cephalometric landmarks and reference lines used for the assessment of lateral X-ray films: A-subspinale-deepest point of the subspinal concavity, AA-anterior atlas-most anterior point of atlas, ANS-anterior nasal spine, AR-articulare-intersection of inferior contour of the cranial base and posterior contour of the ramus mandible, B-supramentale-deepest point on the anterior contour of the mandibular symphysis, BA-basion-most posteroinferior point on the clivus, GN-gnathion-most anteroinferior point of the mandibular symphysis, GO-gonion-point at the gonial angle located on the axis of the angle formed by tangents to the body and ramus of the mandible, ME-menton-lowest point of the mandibular symphysis, N-nasion-most anterior point on the frontonasal suture, PNS-posterior nasal spine, S-sella-center of sella turcica, UT-uvula tip-tip of uvula, NSL-nasion sella line, line through N and S, NL-nasal line, line through ANS and PNS, ML-mandibular line, line through ME and GO, 1. PNS-PHW1, 2. PAS(NL), 3. MinPAS, 4. PAS(UL), 5. PAS(ML)

cranial base (BA-N); the depth of the maxilla (PNS-A, ANS-PNS); the length of the mandibular body (GO-GN, GO-ME); the posterior height of the lower face (GO-PNS) (15); the anterior height of the lower face (ANS-ME) (11); the anterior and posterior facial height (N-GN, S-GO); the depth of the upper face (BA-A); and the distance between the posterior spine and atlas (AA-PNS) (4). As the soft tissue parameters the angle between the uvula and plane of the palate (NL/PNS-UT) (4) and the length of the soft palate (PNS-UT) were measured (11). The size of the posterior airway space (PAS) was measured in several planes: nasal PAS (NL), mandibular PAS (ML), the plane at the tip of the uvula PAS (UL) and the BA-PNS plane (PNS-PHW1) (4). The narrowest spot of the pharyngeal airway space (MinPAS) and the thickness of the posterior pharyngeal wall at the level of the basion (BA-PHW1) were identified (4).

Table 1. Mean values of basic clinical characteristics in group A (mild SAS) and group B (severe SAS): parameters of MESAM 4 and POLYMESAM and patient's age, neck circumference and body mass index (BMI).

	Group A		Group B		Difference	Significance
	Mean	SE	Mean	SE	D	P-value
ODI	15,00	1,06	49,90	3,42	34,90	0,0000
Basal oxygen saturation	95,50	0,19	94,24	0,51	1,26	0,025
Average of oxygen sat. decreases minimas	90,72	0,23	85,49	0,96	5,23	0,000004
Age	48,27	1,44	49,46	1,82	1,19	0,611
Neck circumference	42,28	0,36	44,20	0,71	1,92	0,020
BMI	29,08	0,56	33,04	1,14	3,96	0,003

EXAMINATION OF SLEEP

For the diagnosis of SAS, the all-night monitoring, MESAM4 and POLYMESAM were used. MESAM 4 is an off-line monitoring system registering respiratory sounds (snoring), oxygen saturation, heart rate and body position (12). By this method SAS was confirmed in 45 patients. POLYMESAM is the same method extended by the recording of airflow, respiratory movements of the chest and abdomen and movements of the lower extremity. By this method SAS was confirmed in 36 patients. The records were visually analysed.

For statistical processing the following parameters were used:

1. Oxygen desaturation index (ODI) - mean number of times per hour that oxygen saturation of the blood drops by more than 3%. ODI corresponds roughly to the apnoea index (mean number of apnoeas per hour).
2. Basal oxygen saturation (%).
3. Average of minimal saturation values.

SOMATOMETRIC EXAMINATION

Neck circumference, body weight and height were measured. From the latter two the body-mass index was calculated (BMI = weight (kg)/height $(m)^2$ which indicates the patient's height/weight ratio.

PATIENTS

Cephalometric analyses and all-night monitoring were performed in 104 patients with SAS who were not being treated for neuromuscular diseases or acromegaly. In total 23 subjects were excluded from the statistical analysis: in thirteen patients SAS was not confirmed; eight patients had bronchial obstruction, one patients suffered from laryngeal carcinoma and one patient with marked mandibular deficiency was suspect to have Treacher Collins syndrome. The study included 81 men with confirmed SAS, aged 24 to 70 years (mean age 48.87 years).

STATISTICAL ANALYSIS

The patients were divided into two groups: Group A - 44 men with mild SAS (ODI < 30) and group B - 37 men with severe SAS (ODI > 30). From the measured values basic statistical characteristics were calculated, as well as differences between the mean values of the two groups, analysed by a paired t-test.

RESULTS

Table 1 shows the sleep ventilation parameters, age, neck circumference and BMI-body mass index in both groups and their comparison.

Table 2 presents calculated mean values, standard errors of the mean (SE), differences of mean values and the statistical significance of differences between compared groups.

Figure 2 shows in cephalograms the morphological differences of the orofacial skeleton and nasopharynx between the groups with mild and severe sleep apnoea.

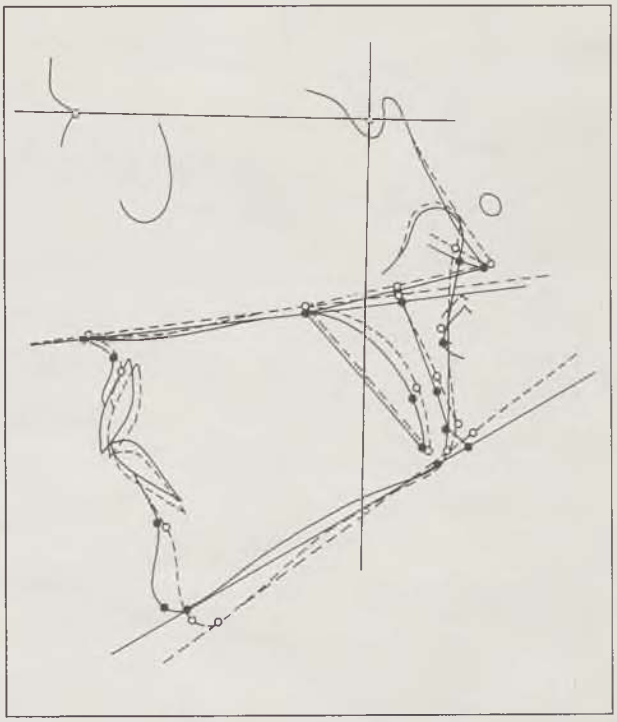

Fig. 2. Cephalograms of patients with mild SAS (solid line) and patients with severe SAS (dashed line).

Table 2. Mean values of measured X-ray cephalometric characteristics in patients with mild SAS (group A) and with severe SAS (group B).

	Group A		Group B		Difference	Significance
	Mean	SE	Mean	SE	D	p-value
SNA	79,72	0,62	78,77	0,74	0,95	0,327
SNB	78,18	0,68	76,44	0,67	1,73	0,076
ANB	1,63	0,51	1,93	0,58	0,30	0,699
NL/NSL	8,53	0,63	8,89	0,50	0,35	0,660
ML/NSL	32,62	1,16	37,35	1,59	4,73	0,021*
ML/NL	24,18	0,94	28,20	1,69	4,02	0,046*
N-S-BA	128,36	0,87	131,03	0,83	2,66	0,030*
N-S-AR	122,78	0,91	126,04	0,99	3,26	0,018*
S-AR-GO	144,18	0,97	143,32	2,13	0,87	0,714
AR-GO-ME	125,97	0,94	128,21	1,29	2,24	0,169
N-GO-ME	76,06	0,88	78,80	1,01	2,74	0,047*
N-GO-GN	73,68	0,86	76,70	1,04	3,02	0,030*
S-GO	95,15	1,14	95,30	1,95	0,15	0,947
N-GN	137,07	1,39	141,00	1,77	3,93	0,087
S-N	78,52	0,57	77,92	0,58	0,61	0,457
BA-N	115,93	0,78	117,17	0,88	1,23	0,296
PNS-A	53,02	0,67	52,69	0,70	0,34	0,728
ANS-PNS	59,44	0,67	58,92	0,61	0,53	0,565
GO-GN	83,11	0,72	82,32	1,22	0,79	0,580
GO-ME	78,39	0,72	77,68	1,27	0,71	0,631
ANS-ME	79,28	1,12	81,85	1,58	2,57	0,192
AA-PNS	37,11	0,72	37,64	0,91	0,53	0,652
BA-PNS	48,00	0,52	49,14	0,74	1,14	0,214
GO-PNS	53,97	0,85	54,55	1,55	0,58	0,745
BA-A	100,74	0,90	102,00	1,17	1,26	0,399
NL/PNS-UT	124,43	1,14	124,72	1,28	0,01	0,996
PAS (ML)	11,91	0,78	10,62	1,22	1,29	0,378
PAS (NL)	25,93	1,50	23,78	0,90	1,45	0,409
PAS (UL)	8,56	0,47	10,00	0,66	1,44	0,080
PNS-UT	47,93	0,93	50,95	1,04	3,02	0,034*
BA-PHW1	22,70	0,51	23,89	0,66	1,18	0,159
PMS-PHW1	25,32	0,55	25,22	0,78	0,10	0,920
Min PAS	5,66	0,48	5,35	0,57	0,31	0,681

* significant difference ($p < 0.05$)

DISCUSSION

In the literature (1, 2, 4, 11, 15) cephalometric findings of SAS patients were compared with the normal healthy population. From the above work it is apparent that there exist certain anatomical abnormalities which predispose to SAS. These include maxillary and mandibular retrognathims, dorsocaudal rotation, enlargement of the anterior and posterior facial height, enlargement of the anterior and posterior height of the lower face, increase of the articular angle and lower gonion angle, diminution of the depth of the upper face, shortening of the length of the anterior cranial base, narrowing of the bony framework of the nasopharynx and airway space and elongation of the soft palate.

In attempt to assess whether these cephalometric differences can also be detected between groups of patients with differing disease severity and whether the severity of the disease depends on the degree of changes in the orofacial skeleton and adjacent soft tissues.

In the group of patients with severe SAS, as compared with those with mild SAS, the following differences were observed: elongation of the soft palate (PNS-UT), dorsocaudal rotation of the mandible (increased ML/NSL, ML/NL angle), increased saddle angle (N-S-AR), increased angle of the cranial base (N-S-BA), increased lower gonial angle (N-GO-ME), and increased angle of inclination of the mandible (N-GO-GN). Differences in the degree of hypertrophy of the soft palate (longer velum), dorsocaudal mandibular rotation (increased ML/NL, ML/NSL angle) and increased lower gonial angle (N-GO-ME) can thus be found not only between the healthy population and patients with apnoea (1, 4) but also between patients with mild and severe apnoea. Statistically important difference between SAS subjects and healthy people in SNA, SNB, ANS-ME, N-GN, PAS (ML, NL) found by Bacon et al. (1) and Hochbach et al. (4) was not found in this

study comparing two groups of SAS subjects. An increased saddle angle (N-S-AR), angle of the cranial base (N-S-BA) and angle of inclination of the mandible (N-GO-GN) in the group of patients with severe apnoea were found. The increase of these angles found in studies comparing healthy and SAS subjects (4, 15) was only slight.

In patients of this group, cephalometry contributed to the most accurate characterisation of the morphological abnormality and to the localisation of the site of possible obstruction. Thus it can help in deciding on the type of treatment. In patients where mandibular retrognathism has been proved, mandibular orthodontic protraction is suitable treatment. In patients with an enlarged uvula but an adequate pharyngeal air space, uvulopalatopharyngoplasty is possible treatment. The retrognathism or some other serious abnormality of the facial skeleton is a contraindication to uvulopalatopharyngoplasty. Conversely, orthodontic protraction is more useful in retrognathism without major elongation of the velum.

The results, which reveal a significant difference in BMI between groups A and B and a significant difference in the circumference of the neck between groups A and B, confirm the idea that the most important predisposing factor for SAS is obesity, in particular deposition of adipose tissue in the posteriolateral parapharyngeal space (5, 12).

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BODY STRUCTURE OF FEMALE - TO - MALE TRANSSEXUALS

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SUMMARY

31 female - to - male transsexuals treated in the Department of Plastic Surgery, Medical University of Łódź, were examined. Anthropometric measurements were carried out according to Martin's technique. 23 measured characteristics of the examined transsexuals were studied; they were compared with identical characteristics in males and females of the control group. The results indicate that the somatic characteristics in transsexual women are between the values typical for man and women.

ZUSAMMENFASSUNG

Der Körperbau bei Frau-Mann Transsexualen.

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An der Abteilung für plastische Chirurgie der Medizinuniversität in Łódź wurden 31 Transsexualen mit der Orientation Frau zu Mann untersucht. Die antropomethrischen Angaben wurden mithilfe der Martinstechnik gewonnen. 23 gemessene Charakteristiken, die bei den untersuchten Transsexualen gewonnen wurden, wurden mit den identischen Angaben der Männer und Frauen in der Kontrollgruppe verglichen. Die Ergebnisse allgemein beweisen die vorübergehende Position der somatischen Charakteristiken bei transsexualen Frauen zwischen den Werten, die für Männer und Frauen typisch sind.

Key words: transsexualism; anthropometric study.

The term of „transsexualism" was introduced by Coudwell in 1949 and popularized by Benjamin (1). According to Imielinski, it means the discrepancy between the personal gender identity and the morpho-biological body structure as well as the socially stated sex (of a register, legal), which are considered „strange" and belonging to the opposite sex (2). Nowadays, the term of „sex disapproval syndrome" is used for transsexualism as well. Transsexualism, as the specific kind of sexual aberration, arouses doctors' interest all over the world. According to Imielinski, this aberration is not a sexual deviation and it is not placed primarily in their sexual sphere (3, 4). The sexual problems are secondary however, the nature of this aberration lies much deeper and it concerns the identification and the role of sex. The sexual interests of transsexuals recede into the background in comparison with their anxiety to adjust their body structure to the psychically experienced sex and the social acceptance of the chosen role. The frequency of transsexualism is, according to world - wide investigations 1:60 000, while in Poland 1:150000 (1). For the clinical purpose, the terminological distinction of transsexuals into two types was introduced: female - to - male (male gender identification with female body structure) and male - to female (female gender identification with male body structure) (1-4).

Etiology of transsexualism has not been explained so far. There are a few hypotheses concerning the etiopathogenesis of this aberration. Many authors indicate the role of environmental factors, and among them, such stressors as family relationships as well as educational errors. Constitutional - hereditary and biological factors, genetic, endocrinological, neurotransmitter and other factors that have not been found so far, have the additional influence. The results of the investigations that have been performed for the last few years, in which more and more perfect diagnostic techniques have been applied, especially dynamic tests with the usage of LH-RH to evaluate neuroendocrinological system and determinning H-Y antigen in transsexual, have thrown new light on the pathogenesis of transsexualism. The obtained results suggest that transsexualism might be the consequence of neuroendocrinological defect in hypothalamus or in pituitary gland or it can also occur as the inbred psychoendocrinological syndrome. The meaning of CNS neuro-

transmitter substance, which in connection with the disadvantageous environmental factors lead to the sex disapproval syndrome is stressed (1-7).

The surgical treatment assisted by hormone therapy is the only efficient form of medical aid for transsexuals. In the Department of Plastic Surgery, Medical University of Łódź, over 298 transsexuals were surgically treated in the years 1984 - 1995 (8-12). Numerous investigations have been also undertaken in order to explain the etiopathogenesis of sex disapproval syndrome. Among them, anthropometric research is being carried out (13). We performed anthropological characteristics of a head in transsexual women which proved a slight aberration of measurement values towards the male measurement values. The dimorphous features of hair turned out to be significantly differentiated. The highest degree of consistence with the primary morphobiological sex was found as far as the type of pubic area hair is concerned (16).

In the available literature we found only a few publications dealing with the evaluation of the body structure in small groups of transsexuals (17-19). Taking into consideration the shortage of information on the peculiar character of transsexual persons' somatic structure, we decided to analyse this problem widely on the basis of more numerous sample and to make it more detailed by determining the direction as well as the degree of aberrations in somatic structure of female - to - male type transsexuals in relation to Polish population.

MATERIAL AND METHODS

Thirty one transsexual women, aged from 21 to 51, mean age = 34 years, from among 298 transsexuals treated in the Department of Plastic Surgery, Medical University of Łódź in the years 1984-1995, were examined. All patients had gone through the 2-year trial period of „real life" earlier; it consisted in their functioning in the family and the society in accordance with the sex experienced by them. During this period numerous diagnostic investigations - psychological, psychiatric, sexological, endocrinological and gynecological - were carried out and finished with the diagnosis of transsexualism put forward. On the basis of a group of specialists' opinion transsexuals legally solicited „the legal statement of birth certificate rectification", which next entitled them to change the identity card. The preliminary treatment consisted in hormone therapy by an endocrinologist. The plan of surgical treatment comprised: reduction of the breasts, panhysterectomy and formation of the penis and the scrotum.

The control group comprised 130 patients, 73 men and 57 women, aged 21-51 years, mean age = 34 years, with correct sexual orientation, with no defects in body-build, treated in National Clinical Hospital No 1 of Łódź in Feb. the 1-st - Apr. the 30-th 1997. Anthropometric examinations were carried out in accordance with Martin's technique (14). In this study the following measurement features were considered: 1) body height (B-V); 2) body weight; 3) episternum jugular incisure height (B-sst); 4) symphysial height (B-sy); 5) trunk length (sst-sy); 6) arm length (styda III); 7) arm breadth (mz-mu); 8) biacromial breadth (a-a); 9) chest breadth (thl-thl); 10) saggital diameter of the chest (xi-ths); 11) hip-breadth (ic-ic); 12) interspinal breadth of pelvis (is-is); 13) elbow breadth; 14) knee breadth; 15) head circumference; 16)neck circumference; 17) arm circumference; 18) chest circumference minimum; 19) waist circumference; 20) hip circumference; 21) upper thigh circumference, 22) the force of flexor muscles of right hand fingers (dynamometer); 23) the force of flexor muscles of left hand fingers (dynamometer).

On the basis of the measurements the following indexes of body structure were calculated:
1) trunk - body height (sst - sy) x 100 : (B - V)
2) symphysial height (B - sy) x 100 : (B - V)
3) biacromial - body height (a - a) x 100: (B - V)
4) hip- body height (ic - ic) x 100 : (B - V)
5) biacromial width (a - a) x 100 : (sst - sy)
6) hip-width (ic - ic) x 100 : (sst - sy)
7) saggital diameter of the chest (xi - ths) x 100 : (thl - thl)
8) ilio-biacromial (ic - ic) x 100 : (a - a)
9) Quetelet's weight - body height in g : (B - V) in cm
10) Rohrer's index - weight in g x 100 : $(B - V)^3$ in cm
11) Skerlja's index - upper thigh circumference x 100 : (B - V)
12) waist circumference x 100 : hip circumference
13) thigh circumference x 100 : hip circumference
14) thigh circumference x 100 : waist circumference
15) chest circumference x 100 : thigh circumference
16) Marty's index - chest circumference x 100 : B - V
17) Pignet's - Verwaeck's (body weight + chest circumference minimum) x 100 : B - V

The values of five indexes - 1, 5, 7, 8, 10 - were used by us to calculate the somatic structure of the examined patients with reference to the values for men and women in accordance with Wanke's typology (14, 15).

RESULTS

The average values of anthropometric features of the examined transsexual women against the background of the control group of men and women are presented in Table 1. These data indicate that the majority of the examined features exceeds the values typical of young women. Values, which are identical to them, concern only arm length, elbow breadth, interspinal breadth of pelvis and head circumference. Features, which deflect most towards those typical of men, are: circumference of arm, upper thigh, hips and chest as well as biacromial breadth and the breadth as well as saggital diameter of the chest and the

Table 1. Anthropometric characteristics of female - to - male transsexuals as compared to control males and females.

No	Trait	X	SD	X_M	SD_M	SDS_M	X_F	SD_F	SDS_F
1.	B-V	166,9	7,2	175,4	6,9	-1,23	163,2	6,1	+0,61
2.	body weight	66,8	9,2	71,2	6,5	-0,68	57,4	5,9	+1,59
3.	B-sst	136,8	5,6	143,9	5,5	-1,29	133,1	5,8	+0,64
4.	B-sy	86,1	4,7	87,7	4,4	-0,36	85,2	4,2	+0,21
5.	sst-sy	50,7	3,8	52,2	3,1	-0,48	48,3	3,5	+0,68
6.	sty-da III	17,4	1,0	1,92	1,1	-1,55	17,4	1,0	0,00
7.	mz-mu	7,8	0,5	8,7	0,6	-1,50	7,7	0,4	+0,25
8.	a-a	38,6	1,8	39,8	1,8	-0,66	36,0	1,8	+1,44
9.	thl-thl	27,9	1,8	28,9	1,8	-0,55	24,0	1,6	+2,43
10.	xl-ths	19,2	2,2	20,8	1,8	-0,88	16,9	1,4	+1,64
11.	ic-ic	29,5	2,0	28,7	2,2	+0,36	28,1	2,5	+0,56
12.	is-is	24,4	1,8	23,5	1,8	+0,50	24,4	1,7	0,00
13.	elbow width	6,2	0,5	7,1	0,4	-2,25	6,2	0,4	0,00
14.	knee width	9,2	0,5	9,8	0,6	-1,00	8,7	0,5	+1,00
15.	head circum ference	55,2	1,6	56,5	1,6	-0,80	55,1	1,6	+0,06
16.	cervical circumference	36,3	2,9	37,5	1,5	-0,80	33,2	1,5	+2,07
17.	arm circumference	29,6	3,0	30,2	2,1	-0,29	24,5	2,3	+2,21
18.	chest circumference	90,4	8,0	98,1	5,2	-1,48	80,5	4,9	+2,02
19.	waist circumference	82,8	6,3	79,9	4,9	+0,59	80,2	4,1	+0,63
20.	hip circumference	95,0	7,3	94,0	4,5	+0,22	95,4	5,1	-0,78
21.	upper thigh circumference	57,2	5,3	54,5	3,6	+0,75	55,0	4,1	+0,54
22.	dynamometry of left upper limb	44,9	5,5	48,0	8,4	-0,37	31,3	6,6	+2,06
23.	dynamometry of right upper limb	45,8	5,7	53,5	8,7	-0,88	32,4	6,8	+1,97

X - mean value of the trait in examined group; **SD** - standard deviation of the trait in examined group; **XM** - mean value of the trait in male controls; **SDM** - standard deviation of the trait in male controls; **SDSM** - standard deviation score (z-score) from male controls; **XF** - mean value of the trait in female controls; **SDF** standard deviation of the trait in female controls; **SDSF** - standard deviation score (z-score) from female controls.

force of hand and body weight. As far as height features are concerned - height, trunk length, symphysial height, breadth of knee, length and breath of hand, chest circumference - the examined do not reach the values typical of men.

Thus, generally their intermediate position between the values typical of both men and women is confirmed by their body structure features.

The values of body proportions indexes are placed within the range of variability for adults. The first index places the examined and the controls with the medium trunk related to the height and the second one defines all the groups as shortlegged. The third index places the examined transsexuals as wideshouldered and the controls as mediumshouldered. The fourth index defines the examined and the control men as having the pelvis of medium breadth, and the women with narrow breadth. The fifth index referring to the relation of the biacromial distance to the trunk length, places the examined as widershouldered and the controls as mediumshouldered. The examined transsexuals and the control women have wider pelvis in relation to the trunk lenght - index 6, and similarly to the controls they have medium flat chest. The eight index comparing the hip breadth to biacromial width reveals the examined as having the female relationships while in control men they are male. The Quetelet's index places the examined as of very strong body - build like control men, and the control women are of strong build. According to the Rohrer's index the examined have obese build, the control men are medium and women are slim. The Skerlij's index reveals that the examined are obese, and the controls are of medium build. When analyzing the twelfth index, one can notice that the examined have higher waist circumference / hip circumference ratio than controls, which can be at-

Table 2. Mean values of somatic indexes for both transsexuals and controls.

No	Index	Examinated group X	SD	Control group X_M	X_F
1.	trunk-length	30,4	1,3	29,8	29,6
2.	symphysial height	51,6	1,2	50,0	52,2
3.	biacromial breadth	23,1	1,3	22,6	22,1
4.	hip - height	17,7	1,2	16,4	17,2
5.	biacromial width	76,1	1,4	75,9	74,5
6.	hip - width	58,2	2,3	55,0	58,1
7.	saggital diameter of the chest	68,9	4,9	72,0	70,4
8.	ilio-biacromial	76,4	4,7	72,5	74,6
9.	Quetelet's weight-body height	400,0	48,0	405,9	351,7
10.	Rohrer's index	1,43	0,2	1,32	1,32
11.	Skercja's index	34,3	2,7	31,1	33,7
12.	waist circumference	87,1	2,4	85,0	84,1
13.	thigh circumference: hip circumference	60,2	1,8	58,0	57,7
14.	thigh circumference: waist circumference	61,9	2,1	68,2	68,6
15.	chest circumference: hip circumference	95,2	2,4	104,4	84,4
16.	chest circumference: body height	54,2	3,2	55,9	49,3
17.	(body weight+18) x 100 : body height	94,2	4,3	96,5	84,5

X - mean values of somatic indexes in transsexuals examined; **SD** - standard deviation of somatic indexes in transsexuals examined; **XM** - mean values of indexes in male controls; **XF** - mean values of indexes in female controls.

Table 3. The somatic structure of examined transsexual women in relation to normal man and women

	I%	A%	V%	H%	structure
M	30,3	15,7	29,2	24,7	I > V > H > A
F	42,7	11,6	30,6	15,1	I > V > H >A
Mędraś	39,6	11,2	28,4	20,8	I > V > H > A

M - somatotype of transsexual women (examined group), defined on the basis of normal values for men
F - somatotype of transsexual women (examined group), defined on the basis of normal values for women

tributed to the masculine type of fat tissue location - in the region of abdomen and not the hips. As the thirteenth index shows they also have a higher ratio of thigh circumference and a lower one of thigh circumference / waist circumference (index 14). The ratio of chest circumference / hip circumference (index 15) indicates the intermediate position between the values of normal men and women. The chest circumference in relation to height - Marty's index, tells about the growth of chest and it is close to men and clearly higher than in women. The value of Pignet's - Verwaeck's index (17) places the examined and the control men within the group of wide build, and women within the group of medium build (Table 2). The somatic structure of the examined is presented, calculated after the Wanke's method, with reference to the mean values for men and women (Table 3). We also present similar results of research by Mędraś and co (18).

This method of defining the somatotype separates the types of silhouette similar to describing them letters, on the basis of index marked: 1, 5, 7, 8, 10 in the table.

The somatic structure of examined transsexual women, in relation to normal men and women shows the somatic supremacy of I and V over H and A. It is similar to the somatic structure of control men and women (Table 3).

CONCLUSIONS

1. The somatic structure of female to male transsexuals is placed between the upper level of feminine features and the lower level of masculine features.

2. The proportions of body build of transsexual women, expressed by the indexes, indicate the shift towards males, confirming the results of measurements.

3. The high values of measures of body weight, arm circumference and chest circumference in the examined may result from the hormone therapy.

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SOUHRNY

Primární rekonstrukce mandibuly Silastikovým implantátem u pacientů s rakovinou hlavy a krku. Přehled o 69 případech.

H. M. Bhathena, N. M. Kavarana

V nemocnici „Tata Memorial Cancer Hospital" jsou používány různé metody sloužící k primární rekonstrukci mandibuly - od složitého myokutánního nebo osteomyokutánního laloku m. pectoralis major až po přenos vaskularizované tkáně s mikrovaskulárními anastomózami včetně volného vaskularizovaného kostního štěpu z hřebene kosti kyčelní nebo z volného laloku z předloktí napojeného na arteria radialis, včetně kostního štěpu z radia, volného vaskularizovaného štěpu z fibuly a silastikové mandibulární implantáty.

Klinické výsledky jsou prezentovány u 69 pacientů, bezprostředně po mandibulární rekonstrukci silastikem (SMI).

Z 69 pacientů 2 pacienti zemřeli ihned po operaci. 20 pacientů (30 %) SMI přežívalo od 1 do 5 let. 47 pacientů (70 %) SMI přežilo méně než 1 rok. Implantáty byly užity u různých případů s rekonstrukcí nebo bez rekonstrukce velkého laloku, tam kde byl vhodný kostěný podklad, zejména po resekci mandibulárního oblouku.

Výsledky prokazují důležitost implantátu pro udržení prostoru u rozsáhlých kancerogenních lézí, kde je vysoké riziko infekce, hematomu a úniku slin. Ve vhodných případech byla kost voperována později. Byl též studován efekt chemoterapie a radioterapie na retenci těchto implantátů.

Profylaktické podávání antibiotik při chirurgickém zákroku u rakoviny hlavy a krku s rekonstrukcí pomocí velkého laloku: jednodenní podávání Cefoperazonu oproti pětidennímu podávání Cefotaximu.

H. M. Bhathena, N. M. Kavarana

Pacienti, kteří podstoupí operativní zákrok rakoviny hlavy a krku pomocí rekonstrukce velkým lalokem, mají prospěch z perioperativní profylaxe antibiotiky. Chirurgický zákrok v oblasti hlavy a krku, obzvláště ablativní chirurgie rakoviny s rekonstrukcí pomocí velkého laloku, je potencionálně kontaminovaná iatrogenní rána a užití před-, peri- a pooperativní chemoprofylaxe infektu je nutná. Tato studie byla provedena ke zjištění, zda krátkodobé podávání antibiotik bude účinnější (Cefoperazon) než klasická pětidenní léčba Cefotaximem. Pro studii byli vybráni pacienti, u nichž byla po rozsáhlém ablativním zákroku pro rakovinu hlavy a krku nutná rekonstrukce pomocí velkého laloku. Volba a výběr ideálního antibiotika jsou stále ještě předmětem diskuse.

Pacienti byli zařazeni randomizací do skupiny s podáváním Cefoperazonu po 24 hodin (studijní skupina) nebo Cefotaximu po 120 hodin (kontrolní skupina). Celkem bylo do studie zařazeno padesát pacientů. Byl sledován výskyt infekce, odumření laloku a další závažné komplikace. Z 50 sledovaných pacientů bylo 28 zařazeno do skupiny jednodenní intenzivní profylaxe. Selhání této metody bylo zjištěno u 7,1 % této skupiny. 22 pacientů bylo zařazeno do skupiny 5denního podávání, neúspěch profylaxe byl 9,8 %. Tato studie předpokládá, že delší podávání antibiotik než 24 hodin pooperativně u pacientů, kteří podstoupili ablativní operaci rakoviny hlavy a krku s rekonstrukcí pomocí velkého laloku, nemá význam.

Rekonstrukce paralyzovaného m. biceps brachii transposicí stopkovaného m. latissimus dorsi. Popis dvou pacientů.

P. Haninec, V. Smrčka

M. biceps brachii byl rekonstruován u dvou nemocných se zastaralým poraněním plexus brachialis. M. latissimus dorsi byl transponován na thorakodorsálním nervově-cévním svazku do regio brachii anterior a našit na dlouhou hlavu m. biceps brachii. Distální část m. latissimus dorsi

byla sešita nad tuberositas radii s úponovou šlachou m. biceps brachii. Oba pacienti dosáhli 12 a 16 měsíců po operaci velmi dobrou obnovu flexe v loketním kloubu.

Zastaralé léze kolaterálních ligament kloubů palce ruky.

V. Smrčka, R. Pluhařová

Zastaralé léze 2-18 měsíců od úrazu kolaterálních ligament metakarpophalangeálního (MP) kloubu palce a policizovaného proximálního interphalangeálního (PIP) kloubu byly nahrazeny šlachovým transplantátem z m. palmaris longus.

V souboru byli 4 pacienti 34-46 let s posttraumatickým postižením ulnárního kolaterálního ligamenta MP kloubu palce a 7leté dítě s vrozeným postižením radiálního kolaterálního ligamenta.

Laterální nestabilita 30 stupňů předpokládá postižení kolaterálního ligamenta. Při vyšetření rozsah nestability v našem souboru se pohyboval od 45 do 90 stupňů. Doporučujeme srovnání s druhostranným zdravým palcem.

Kraniofaciální abnormity při spánkovém apnoickém syndromu.

S. Dostálová, Z. Šmahel, K. Šonka

104 mužů se suspektní diagnózou spánkového apnoického syndromu (SAS), kteří nebyli léčeni pro akromegalii, bylo vyšetřeno rtg kefalometrií. Po vyřazení nemocných s bronchiální obstrukcí, pacienta s laryngeálním karcinomem, se suspektním Treacher-Collinsovým syndromem a pacientů, u nichž SAS nebyl prokázán, bylo zbývajících 81 mužů rozděleno na dvě skupiny podle tíže onemocnění vyjádřené průměrným hodinovým indexem kyslíkových desaturací (menší než 30 - skupina A, větší než 30 - skupina B). Ve skupině B oproti skupině A byly signifikantně změněny následující parametry: dorsokaudální rotace mandibuly, prodloužení měkkého patra, zvětšení úhlu selly, úhlu base, dolní části goniového úhlu a úhlu inklinace mandibuly.

Rozdíl ve velikosti měkkého patra, v rotaci mandibuly a ve velikosti dolní části goniového úhlu se tedy dá vysledovat nejen mezi zdravou populací a apneiký, ale také mezi lehkými a těžkými apneiky.

Tělesná stavba transsexuálů s orientací žena - muž.

B. Antoszewski, J. Kruk-Jeromin, A. Malinowski

Na oddělení plastické chirurgie lékařské university v Lodži bylo vyšetřeno 31 transsexuálů s orientací žena - muž. Antropometrické údaje byly získány pomocí Martinovy techniky. 23 měřených charakteristik, získaných u vyšetřovaných transsexuálů, bylo srovnáno s identickými údaji mužů a žen kontrolní skupiny. Výsledky obecně prokazují přechodnou pozici somatických charakteristik transsexuálních žen mezi hodnotami typickými pro muže a ženy.

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