



Quality of Life after Plastic and Reconstructive Procedures in the Hip and Anogenital Region

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Abstract

Introduction: Plastic and reconstructive procedures of the pelvis, groin and anogenital regions aim to restore form and function. Close proximity to the rectum, outer and internal genitals, makes these reconstructive procedures demanding for the surgeon.

Diseases and defects after trauma, or tumour resection and concomitant functional disorders, result in physical and psychological distress for the patient. The impact on the patient continues post operation, affecting their ability to rehabilitate back into a balanced social life. This paper presents an inaugural study into health related quality of life assessment of patients, post plastic and reconstructive procedures of the pelvis, groin and anogenital regions.

Material and Methods: From 2006 until 2013 24 patients were incorporated into this retrospective and monocentric study. The health related quality of life was recorded via the SF-36 questionnaire (female/n=9 and male/n=15). The average age was 56,88 years (36 to 75 years). In 15 cases, defects were the result of tumour resection and in 9 cases, a result of trauma. In two cases, a one-stage, and in the other cases, a multiple-stage defect closure was performed. The interval from diagnosis to defect closure was on average 0,96 years ($\pm 1,44$ years) in the trauma group, and 2,91 years ($\pm 2,24$ years) in the tumour group.

Results: Defect related physical impairment is considered more serious than the underlying disease. Women tend to rate their physical and psychological quality of life more highly, when compared to men. One-stage defect closure influences health related quality of life more favourable than multiple-stage procedures. There is greater age dependency in the physical dimensions. As expected, tumour patients have a poorer health related quality of life compared to trauma patients. Quality of life is rated more highly after free flap transfer, compared to pedicle flaps. Anus praeter, and urinary incontinence, have no influence on the quality of life.

Conclusion: Plastic and reconstructive procedures that aim to treat defect closure of the pelvis, groin and genitoanal region, lead to quality of life and health related improvements.

Keywords: Quality of life; Anogenital; Defect closure; SF 36; Incontinence

Introduction

Plastic-reconstructive procedures of the pelvic, groin and anogenital region present a challenge because of their close proximity to the rectum and genital area [1]. These procedures aim to restore function, such as continence, but also aesthetical appearance and quality of life. Affected patients often suffer from considerable stresses caused from the resulting resection, after tumours or trauma in this anatomical area. General social life activities, personal integrity, and quality of life, therefore, are affected in this group. The role of plastic reconstructive procedures is therefore immensely important in the multidisciplinary approach adopted by plastic surgeons, trauma surgeons, urologists, general surgeons and oncologists. The aim of the study is to evaluate the related quality of life of the affected patient group, using established indices such as the SF-36 and the Index of severity for osteoarthritis of the hip and knee [2-4], whilst recording and analysing specific values such as incontinence of urine, stool, or impaired sexual activity, which is not included in the above questionnaires, but was assessed by a self-developed questionnaire in this study.

In detail we investigated how specific patient parameters such as sex, age, and incontinence of urine or stool influence health related quality of life following reconstructive procedures in the

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Table 1: Patientdata.

Surname: name: Date of birth: sex:		Diagnosis:		
Case-nr.: address: GP:		Other diagnosis:		
Number of previous operations:				
Operation (plastic surgery reconstruction): Date: Procedure performed:				
Trauma: Date of trauma: Diagnosis: Previous operations:		Tumour: First diagnosed: Stage (pTNM): Previous operations:		
Radiotherapy:		Neoadjuvant		Adjuvant
				Dosage in Gray
Chemotherapy:		neoadjuvant		adjuvant
Woundcomplications (yes/no) (Infection, seroma, haematoma, fatnecrosis, wounddehiscence)				
Loss of flap:		partial		complete
Rehabilitation:				
Discharge:				
Death:				

Table 2: Grading system of fecal incontinence (Jokuszies & Lipski).

Grade	Grade	Grade	Grade	Grade
0	I	II	III	IV
None	Slight inability to distinguish between flatulence and defecation	Mild inability to distinguish between flatulence and defecation	Uncontrolled defecation	Artificial anus

Table 3: Grading system of urine incontinence (Jokuszies & Lipski).

Grade	Grade	Grade	Grade	Grade
0	I	II	III	IV
None	Urination while coughing, pressing, sneezing, lifting and heavily physical stress	Urination while light physical stress (i.e. walking, standing up)	Urination while lying or standing	Urine catheter or artificial urinary outlet

pelvic, groin or anogenital region.

To investigate the correlation between specific parameters and health related quality of life we focused additionally on the defect cause (tumour vs trauma), the type of tissue transfer, the timing of reconstruction and the number and type of reconstructive procedure (microvascular free flap or local flap) and their impact on quality of life.

Material and Methods

From 2006 to 2013 (7 years), 24 patients (9 female, 15 male) were included in the following plastic reconstructive procedures of the pelvic, groin and anogenital region and these data informed a retrospective, monocentric study. Data collected for each patient is shown in Table 1.

Following consent to participate in the study and an introduction, patients received 3 questionnaires regarding subjective self-evaluation of their health related quality of life. The SF-36 questionnaire, indices of severity for osteoarthritis of the hip and knee and a specifically developed questionnaire to evaluate the function of the bladder, the rectum and sexual activity were used. Only fully completed returned questionnaires were included in the study. The SF 36 is a generic instrument to measure therapy success, using subjective evaluation of health related quality of care of patient groups [2-5]. It represents an

internationally comparable instrument, and can be used in patients above the age of 15. The SF 36 was used in 1998 in Germany to measure the health related quality of life in 6964 people between the ages 18-80. The results demonstrated a random sample of the normal population of Germany [3]. The SF-36 (Short form) consists of 36 items (questions) grouped into 8 different domains:

1. Physical Functioning (PF)
2. Role Physical (RP)
3. Bodily Pain (BP)
4. General Health (GH)
5. Vitality (VT)
6. Social Functioning (SF)
7. Role Emotional (RE)
8. Mental Health (MH)

These can be divided into two groups: physical health [1-3] and psychological health [4-8]. Each category can score a value between 0 and 100, 0 being the lowest score and 100 the highest achievable score [5]. Higher SF-36 scores correspond to a higher health related quality of life. A difference in the score of 10 to 15 points is considered clinically significant [6].

Table 4: Sexual activity (Jokuszies & Lipski).

Grade	Grade	Grade	Grade
I	II	III a	III b
No complaints	serious difficulties due to surgical procedure	Impossible due to surgical procedure	Impossible for other than procedure specific reasons

Table 5: Patient profile.

Pat	Sex	Age	Diagnosis	Prev-OP's	Defect-localisation	Therapy	Complication
1	m	36	Metastatic rectal cancer after exenteration of the pelvis	> 3	Perineum	Latissimus dorsi-free flap	none
2	m	64	recurrent rectal cancer after pelvic exenteration	> 3	Perineum	Latissimus dorsi-free flap with AV-Loop	none
3	m	68	Recurrent rectal cancer after rectum extirpation	> 3	Perineum	Latissimus dorsi-free flap with AV-Loop	Delayed wound healing
4	w	55	Recurrent anal cancer after abdominoperineal rectum-, uterus-, and vaginal extirpation	> 3	Perineum	Latissimus dorsi-free flap with AV-Loop	none
5	m	66	Carcinoma of the penis	> 3	Groin / Abdomen	M. tensor fasciae latae flap and split thickness skin graft	Delayed wound healing
6	m	71	Recurrent fibrosarcoma F right groin with infiltration of the femoral vessels and symphysis	2	Groin / Abdomen	VRAM	none
7	m	40	Anal carcinoma after abdominoperineal rectum extirpation and partial resection of the sacrum	3	Perineum	Latissimus dorsi-free flap	none
8	w	73	Recurrent vulva carcinoma after hemivulvectomy and lymph node exstirpation	> 3	Groin	Tensor fasciae latae flap	none
9	w	65	Malignant melanoma	> 3	Groin	VRAM	none
10	w	63	Recurrent vulva carcinoma and osteomyelitis of the pubis	2 > 3	Perineum	1. VRAM 2. Gracilis muscle flap	1. part. flap loss 2. delayed wound healing
11	m	75	Recurrent melanoma of the groin	1	Groin	Tensor fasciae latae flap / sartorius flap	Delayed wound healing
12	m	66	Recurrent sarcoma of the left groin	3	Groin	Groin flap	Delayed
13	m	56	Carcinoma of the bladder	1	Pubis	Rectus femoris muscle flap and split thickness skin graft	Delayed wound healing
14	w	58	Decubitus of the sacrum after spinal decompression	0	Sacrum	Gluteal rotational flap	none
15	m	67	Multiple Sklerosis with decubiti of the sacrum and ischium	1	Sacrum / Ischium	Gluteus muscle flap and transposition flap	Delayed wound healing
16	w	56	Decubitus of the sacrum and cachexia	0	Sacrum	Gluteal rotational flap	Delayed wound healing
17	m	41	Complicated fracture of the acetabulum	3	Hip / trochanter	Gluteus max. muscle flap	none
18	m	49	M. Crohn after anorectal extirpation	1	Perineum	Gracilis muscle flap	Delayed wound healing
19	w	59	Nekrotizing Fasziiitis after exarticulation of the right hip	3	Hip	Gluteal rotational flap, transposition flap, VRAM	none
20	w	43	Pleomorphic gluteal sarcoma	1	Gluteus	Gluteal rotational flap	Delayed wound healing
21	m	58	Instabile scar of the coccyx after polytrauma	2	Coccyx	Gluteal rotational flap	none
22	m	77	Perineal sarcoma	3	Sacrum / perineum	Groin flap	Delayed wound healing
23	w	62	Ischiosacral decubitus after humerus fracture	2	Sacrum / Ischium	Gluteal rotational flap	none
24	m	49	Recurrent anal carcinoma after extirpation of the sacrum-, bladder and prostata	> 3	Perineum	Latissimus dorsi-free flap with AV-Loop	Delayed wound healing

The questionnaire adapted from the “Indexes of Severity for Osteoarthritis of the Hip and Knee” was developed combining the “Index of Severity for Osteoarthritis of the Hip” and the “Index of Severity for Osteoarthritis of the knee” questionnaires. These were established by Lequesne et al. to measure the efficacy of medical treatment, longstanding therapy results, as well as define indication for surgical revision [4]. These questionnaires mostly evaluate physical symptoms such as

1. Pain
2. Maximum pain-free walking distance
3. Activities of daily life

It therefore establishes the stage of disability and restrictions in daily life. This method was chosen for the following study, as the evaluated patient cohort is comparable to the cohort in the cited study. In category 1 and 2, a score between 0 and 8 can be given. In category 3, a score between 0 and 12 is given. Hence, the overall score can be between 0 and 18. The higher the number, the higher the disability: >14 points – extremely high disability, 11-13 points – very high disability, 8-10 points - high disability, 5-7 points - moderate disability and 1-4 points – mild disability [4].

Authors of this paper developed a questionnaire to evaluate bladder, rectal, and sexual function. In the above cited and established questionnaires, these functions are not part of the newly developed

Table 6: Incontinence of stool in patient cohort (n=24) / Grading (Parks).

Incontinence	None	Grade I	Grade II	Grade III	Anus praeter
Patients	12	2	0	0	10
%	50	8,33	0	0	41,67

Table 7: Incontinence of urine in patient cohort (n=24) / Grading (Stamey).

Incontinence	None	Grade I	Grade II	Grade III	Catheter
Patients	14	3	1	2	4
%	58,33	12,5	4,17	8,33	16,67

Table 8: Results of questionnaires in relation to "Indexes of Severity for Osteoarthritis of the Hip and Knee.

Severity of disability	None	Mild	Middle	Severe	Very severe	Extremely severe
Patients	3	3	1	3	2	12
%	12,5	12,5	4,17	12,5	8,33	50

questionnaire. The severity of incontinence of urine and stool was orientated on the established grading system by Parks and Stamey, and extended by grade 4 in the presence of an AP or catheter (Table 2,3) [7,8]. Patients with no restrictions of micturition or defecation would be grade 0. The scoring of sexual function was deliberately left superficial to enhance compliance when answering the questionnaire (Table 4).

Correlation of questionnaires was performed using regression analysis. Data analysis was conducted using the statistical program SPSS version 17. Due to the small number of patients (n=24), no statistical significance was possible. Therefore, the mean value and standard deviation was calculated. Calculated values were used for descriptive analysis.

Results

In total, 24 patients (9 female, 15 male) were included in the study (Table 5). The number of operations prior to a definitive plastic reconstructive procedure was as seen in Figure 1.

In total, 33 flaps were used on 24 patients. In 18 (75%) patients, reconstruction was achieved using a pedicled or locoregional flap. In 6 (25%), a free flap was used. 11 (45,83%) cases showed regular wound healing processes without complications. 13 (54,17%) patients developed a wound related complication in the postoperative period. The group receiving a free flap (n=6) showed a complication rate of 33,33% (n=2). In the patient group receiving a pedicled or locoregional flap, the complication rate was 61, 11% (n=11).

The mean timescale between initial diagnosis and reconstruction was in the group related to trauma $0,96 \pm 1,44$ years, and in the tumour related group $2,91 \pm 2,24$ years. Patient discharge was achieved $23,93 \pm 15,25$ days in the tumour group, and $18,33 \pm 10,59$ days in the trauma/decubital ulcer group following definitive reconstructive surgery. Incontinence of stool grade 1 developed 2 patients, whilst 10 patients already had an anus praeter (Table 6). 14 (58,33%) patients showed no problems with micturition, whilst 6 (25%) developed incontinence of urine grade I-III, and 4 patients had either a suprapubic or transurethral catheters (Table 7).

Evaluation of the questionnaires in relation to the "Indexes of Severity for Osteoarthritis of the Hip and Knee" questionnaire, showed disabilities in 21 cases (87,50%) (Table 8).

Global health related quality of life

In comparison to the healthy cohort (n=6964), patients showed

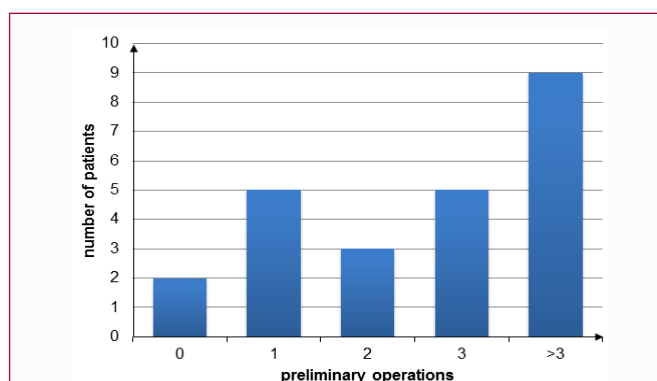


Figure 1: Number of operations prior to a plastic reconstructive procedure in the patient collective (n=24).

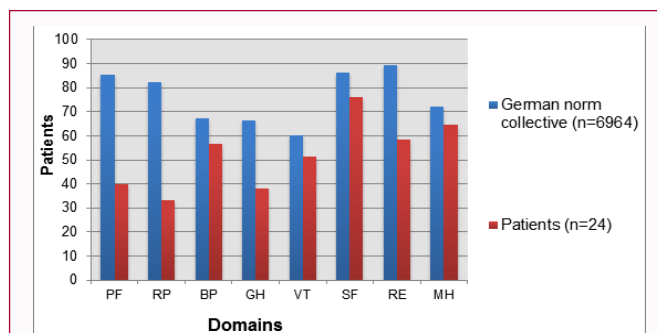


Figure 2: Comparison of the SF-36 evaluations with the German norm collective.

reduced health related quality of life following plastic reconstructive surgery of the anogenital region (n=24). In all 8 dimensions of the SF-36 questionnaire, the results were inferior to those of the healthy population. The most significant differences were seen in the body-related dimensions, especially related to bodily functions (PF): 40,00 points were measured in the reconstructed group, in comparison to 85,48 points in the healthy population (difference 45,48 points). Similar values were seen in relation to role function (RP): 33,33 points in comparison to 82,38 points in the healthy population (difference 49,05 points). In most psychological dimensions, less significant differences were seen: vitality (VT) -8,65; social function (SF) -10,04 and psychological well-being (MH) - 7,73 points. The only exception was the dimension "general well-being" (GH). In this category, the difference was 28,56 points (66,44 in the healthy population vs. 37,88

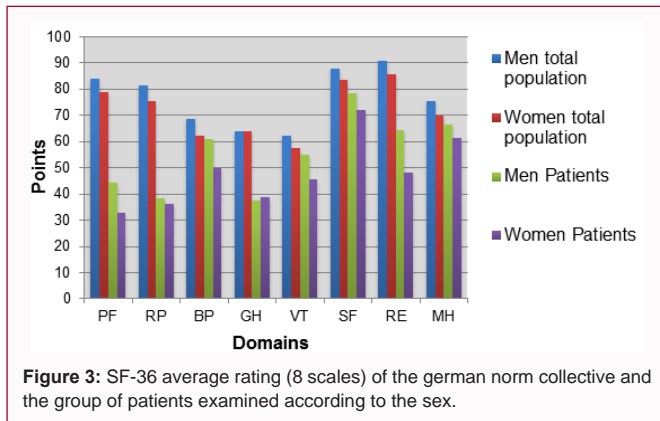


Figure 3: SF-36 average rating (8 scales) of the German norm collective and the group of patients examined according to the sex.

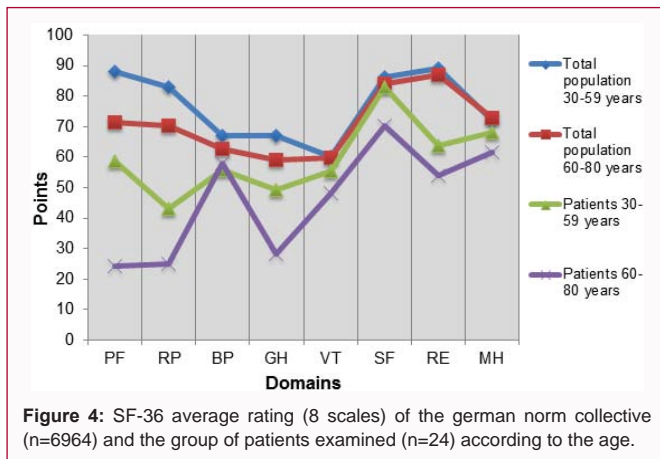


Figure 4: SF-36 average rating (8 scales) of the German norm collective (n=6964) and the group of patients examined (n=24) according to the age.

points in the evaluated group).

In the general population, but also in the evaluated patient group, the evaluation of health related quality of life was worse in females than with males in all 8 dimensions. The only exception was the dimension “general well-being” (GH). These results were more positive in the female cohort, however, this was with 1,27 points so not statistically significant. Also, in the general population, the scale of general well-being was equal between men and women: male – 66,83, female – 66,04 points [9]. In 3 further scales, males had higher values than women: physical role function (RP) – difference here was 2,22 points. Social role function (SF) showed a difference of 6,11 points, and mental health (MH) a difference of 5,07 points. In the other 4 scale ratings (PF, BP, VT, RE) males had significantly better values. Hence, there was a significant gender difference, whereas a difference of 10 points in the SF-36 was statistically significant (Figure 3).

Age dependency

The normal population and the analysed patient collective have clear age dependence in most scale ratings. The scales that evaluate physical aspects show the highest dependency. Younger individuals (30-59 years) in the general population, have higher scale ratings in the evaluation of physical aspects, compared to older individuals (60-80 years). This is the same in the analysed patient cohort. Greatest dependency was found in the ratings of physical function (PF), and physical role function (RP). PF: the difference was 16,59 points in the general population and 34,41 points in the analysed patient cohort. RP: the younger cohort of the general population showed 12,8 points in the general population and 18,18 points in the analysed patient cohort. A similar trend could be shown in the psychological health ratings.

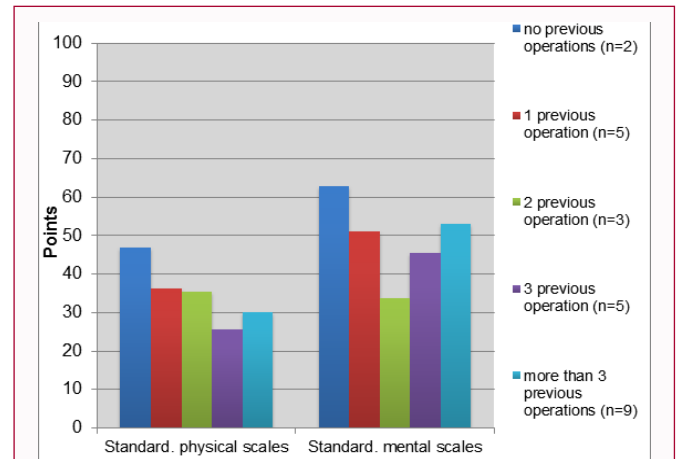


Figure 5: SF-36 average sum rating (2 standardized sum scales) of the group of patients being examined according to the amount of previous operations.

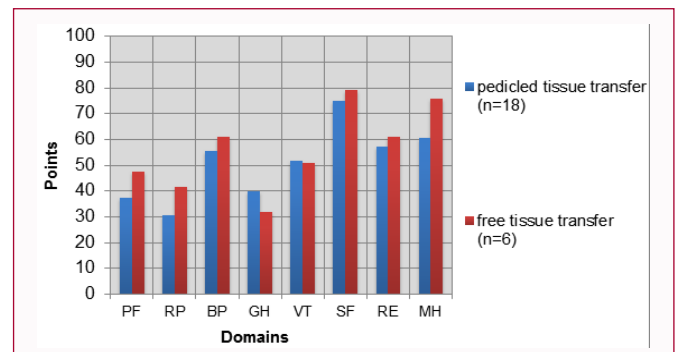


Figure 6: SF-36 average rating (8 scales) of the German norm collective and the group of patients examined according to the flap being chosen (free vs. pedicled).

Low age dependence was seen in the psychological dimensions vitality (0,4 points in the normal population and 7,37 points in the analysed patient cohort), social role function (2,27 points in the normal population in comparison to 12,76 points), and mental health (0,81 points vs 6,46 points). Similarities were also seen in ratings of physical pain (4,5 points in comparison to 2,22 points). In these scale ratings, the differences between patients and normal population were minimal [3,9] (Figure 4).

Immediate vs. delayed reconstruction

Patients with several operations showed lower ratings in the physical standardised scale ratings. Patients that had more than 3 previous operations had 30,10 points in comparison to 25,75 points in patients that had less than 3 previous surgical interventions. This however was not significant. In the psychological standardised scale ratings the measurements were higher and showed less correlation to the number of previous surgical interventions. Patients that underwent immediate reconstruction, rated their own physical (46,93) and psychological (62,74) quality of life higher than patients with delayed reconstruction and several operations. (Figure 5).

Free microvascular vs. pedicled flaps

For analysis of health related quality of life in dependency of the choice of flap, patients were divided into two groups: Group 1 received free microvascular flap coverage. Group 2 received pedicled flap coverage of the defect. A total of 24 patients received 33 different modes of reconstruction (Table 6). 18 patients (75%) received a pedicled flap for definitive coverage; whilst in 6 patients (25%)

Table 9: Flaps being performed for defect closure in the pelvis and anogenital region in the group of patients being examined.

Local flaps (Random pattern flaps)	4
Split thickness skin graft	2
Free myocutaneous latissimus dorsi flap	6
– with AV – Loop for pedicle augmentation	4
Pedicled flaps	21
– thigh – myocutaneous flaps	7
o M.sartorius	1
o M. gracilis	2
o M. rectusfemoris	1
o M. tensor fasciae latae	3
– Gluteal – myocutaneous flaps (M.gluteus maximus)	2
– Gluteal – fasciocutaneous flap	6
o gluteal rotational flap	4
o posterior glutea thigh flap)	2
– Abdomen - VRAM (vertical rectus abdomin is muscle flap)	4
– Groin flap	2

Table 10: Incontinence of stool (n=24) (Parks grading).

Stool incontinence	none	Grade I	Grade II	Grade III	Anus praeter
Patients	12	2	0	0	10
%	50	8,33	0	0	41,67

Table 11: Incontinence of urine (n=24) (Stamey grading).

Urinary incontinence	none	Grade I	Grade II	Grade III	Catheter
Patients	14	3	1	2	4
%	58,33	12,50	4,17	8,33	16,67

received a free microvascular flap (Table 9).

In 3 physical (PF, RP and BP) and 3 psychological (SF, RE, MH) scale ratings, the measurements were higher in group 1 (free flap), compared to pedicled flap coverage: (PF +10,0 points, RP +11,11 points, BP +5,78 points, SF +4,17 points, RE +3,71 points und MH +15,33 points). In the scale ratings of general well-being and vitality, measurements were lower in group 1 than in group 2. However, this was not significant for the ratings of vitality (difference 0,84 points) (Figure 6).

Tumour vs trauma

For analysis of the subjective quality of life, etiology patients were divided in to two groups. Group 1 included patients following resection of a tumour (n=15; 62,50%). Group 2 included all patients following trauma or decubital ulcers (n=9, 37, 50%).

Patients in group 1 (tumour), showed lower ratings in all aspects. Only ratings for social role function were higher in group 1 (78,33 points) compared to group 2 (72,22 points). Ratings for emotional role function showed near equal values. (Figure 6).

Incontinence of Stool and Urine

Incontinence of stool and urine often occurred in patients with defects in the pelvic and anogenital region. 12 patients (50%), from the analysed cohort had developed incontinence of stool, or had an AP. 10 patients (41,67%) had urinary incontinence, or a permanent catheter. Patients were divided into 5 subgroups. (Tables 10,11).

Due to the small number of patients, 3 groups were formed: No

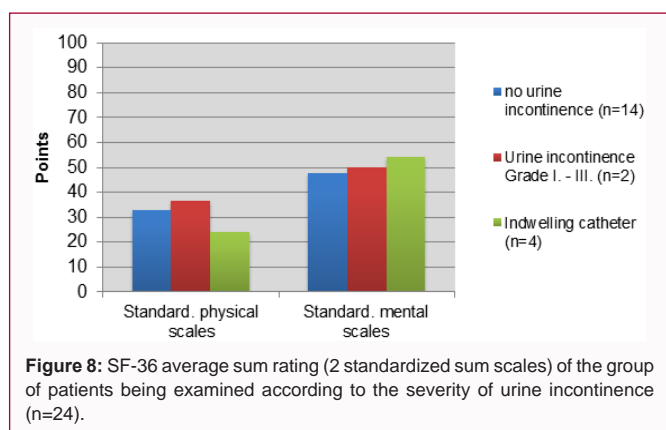
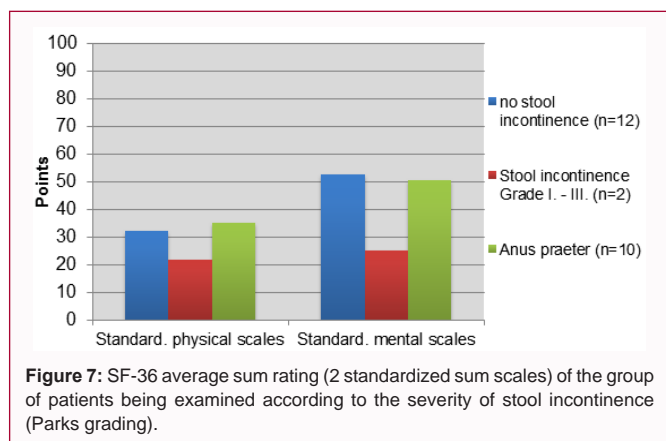
incontinence, incontinence of various grade (Parks and Stamey), presence of a catheter or AP. Quality of life was analysed using 2 standardised summarised scales: physical and psychological summarised scales.

Patients with incontinence of any grading showed higher ratings in psychological scales compared to physiological ratings. Patients with a well-functioning AP, showed even higher quality of life, not only in comparison to patients with incontinence (difference of 13,10 points), but also to patients without incontinence (difference 2,83 points). This differed to mental wellbeing, were patients with an AP showing lower values than patients without incontinence (difference 1,95 points) and higher values than patients with incontinence (difference 25,64 points) (Figure 7).

Patients with incontinence of urine showed a higher quality of life in comparison to patients without incontinence (difference 3,57 points) and significantly higher to the catheter group (difference 12,40 points). Evaluation of the psychological scale ratings, showed higher ratings in the group with no incontinence, while the differences were less significant with 2,48 and 4,07 points (Figure 8).

Discussion

Pelvic and anogenital regions do not only serve a purpose for the function of defecation, but also an important role for reproductive and sexual function [10]. Defects in the anatomical area due to trauma or tumour, often result in complications like delayed wound healing, fistulas or large defects. These present a challenge to the plastic surgeon [11,12]. Not only the surgical aspects, but also the



resulting quality of life after treatment has to be an important part of modern patient management and therapy planning [13].

The patient cohort with reduced physical functions, predictably show a subjectively reduced quality of life. The main differences concern physical functions; differences for psychological functions seem to be less pronounced. A similar phenomenon was shown by Herschbach et al. describing the “well-being paradox” [14]. Chronically ill patients rate their quality of life higher, compared to the normal population and this shows high compensation mechanisms for psychological and physical limitations [15-17]. B.M. Bellach, U. Ellert and M Radoschewski using the SF-36 evaluated 1998 next to the healthy population also physically handicapped and multimorbid patients [3,9,18].

The SF-36 profile of the evaluated patient cohort showed large similarities to the physically handicapped population from the above cited group. Physical functions were even more reduced in comparison to the multimorbid patient group. The psychological well-being was rated more highly.

Overall, women showed lower ratings in comparison to men in all scales using the SF-36 in the healthy population [3]. A correlation between age group and reduction in quality of life could be shown in both the evaluated patient cohort and the evaluated healthy population. This was less pronounced in the ratings for psychological well-being. Here, we could also show different values for different age groups demonstration psychological compensation mechanisms with life experience.

A clear relation between the number of previous operations and values for physical ratings could be demonstrated. This is less

pronounced for psychological values. We rate this as the result of individual compensation mechanisms. An important factor appears to be the length of illness. This is difficult to quantify, however, especially for congenital (spina bifida) or longstanding (multiple sclerosis) entities. Higher ratings in quality of life with a reduced number of previous operations, is an additional factor when planning immediate vs. delayed reconstructions.

The evaluated patient cohort showed differences in the chosen method of reconstruction. In 6 out of 8 ratings patients after free microvascular transfer showed higher quality of life ratings. This was also shown by Kropf et al. [19]. This might be due to the donor area being located away from the reconstructed defect. Pedicled flaps, which are locoregional, show a lower complication rate in comparison to even large free microvascular transfers [20]. Fujioka et al. and Ludolph et al. used a combined free latissimus dorsi and serratus anterior muscle flap to cover large defects [21-22].

Our patient cohort showed a rather large rate of complications (53,72% major and minor complications). This is due to the underlying diagnosis and the reduced general health of the patient cohort. Free flaps showed a significantly lower complication rate in comparison to pedicled flaps (33,33% vs. 61,11%).

A clear recommendation cannot be given due to differences in numbers in the two groups. However the free micro vascular flap remains the gold standard for reconstruction of large defects [23]. Patients in the free flap group showed reduced ratings for general well-being (AGES) (14,40 points vs 22,17 points). The evaluation of general well-being includes questions of future prospects. These seemed to be lower due to the malignant diagnosis in the free flap group in all 6 patients. The ratings for vitality (VITA), both groups showed similar values.

The primary diagnosis has an influence on the quality of life was a difficult evaluation based on the “Indexes of Severity of the Hip and Knee”. Physical estimation was performed which showed similar values in the tumour, and non-tumour group. The SF-36 expands this estimate for psychological assessments, showing higher psychological stresses in the tumour group.

When evaluating differences in incontinence of stool or urine, no significant differences were seen in physical and psychological ratings depending on the form of incontinence. Patients with incontinence of stool and anus praeter (AP) showed higher ratings. This has been previously described by Allal et al. [24]. He compared quality of life estimates in patients following deep anterior resection and abdominoperineal resection using the EORTC QLQ-C30 and the EORTC QLQ-C38. No significant differences were found in both groups [24]. This differs to the results described by Guren et al. following a similar study design concluded that patients with remaining normal anal function showed higher quality of life ratings in comparison to patients with an AP [25]. These results demonstrate the controversy in this subject. Estimates on quality of life following reconstructive measures are further divergent to higher objective and comparable lower subjective ratings as shown by Bordeianou et al. [26].

Further patients with incontinence of urine showed higher results in the psychological standardised ratings when a catheter or a suprapubic catheter was present, in comparison to patients without these regulating measures. However, the differences were not statistically significant.

Evaluation of sexual function is challenging as this is heavily influenced by cultural differences, society and personal expectations. Patients with high impairments in sexual function showed a lower psychological well-being. In contrast, patients with completely missing sexual function showed higher ratings. This could be due to the higher age in this group (58,85 +- 9,88 and 64,25 +- 7,25 years) and the social prejudices to sexual activity in old age. Sexual activity was seen as reproductive act and a taboo in western society for a long time [27]. Ream et al. showed that 66% of women and 85% of men in the age group 60 to 69 had regular sexual intercourse. Above the age 80 this was true for 10% of women and 22% of men. In a survey of 3005 people in America 53% of 57-64 year old and 26% of 75-85 year old reported to be sexually active [28]. Reduction of sexual activity in higher age groups is well documented [29], however the related quality of life remains an important factor [30]. The implications of these results demonstrate significant challenges for the reconstructive surgeon.

Limitations of this study are the relatively small number in patients and the retrospective data collection. Prospective studies evaluating quality of life at different points are currently underway. Comparisons to other similar studies are difficult due to the different entities of defects. Several studies exist evaluating patients with malignancy related defects, however only few studies evaluated patients with traumatic defects and chronic wounds [31]. The tools used in our study are well validated for the evaluation of health related quality of life. Health related quality of life has to be seen as a dynamic concept which has to be assessed depending on patient individualities, patient expectations, coping strategies and acute changes [32].

Conclusion

Physical limitations due to defects in the anogenital region are being rated higher than the actual diagnosis. Women rate their physical and mental quality of life lower in comparison to men. Immediate reconstruction shows to improve quality of life ratings in comparison to delayed reconstructions. Values of physical ratings seem to be age dependent; whilst patients with defects relating to malignancy show an overall lower health related quality of life.

Patients following free microvascular transfer show higher values in comparison to patients receiving locoregional reconstructions. Incontinence of stool or urine does not show influence on health related quality of life.

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