

# Complications and Quality of Life Following Urinary Diversion After Cystectomy

Elmar W. Gerharz<sup>a,\*</sup>, Alexander Roosen<sup>a</sup>, Wiking Månsson<sup>b</sup>

<sup>a</sup>Department of Urology, Bavarian Julius-Maximilians-University Medical School, Oberdürrbacher Strasse 6, 97080 Würzburg, Germany

<sup>b</sup>Department of Urology, University of Lund, Sweden

## Abstract

**Objective:** The aim of this review is to outline specific surgical complications, metabolic consequences and quality of life (QOL) following urinary diversion in patients undergoing radical cystectomy.

**Methods:** Based on a comprehensive literature search (MEDLINE) the published knowledge on urinary diversion was examined regarding the research question with an emphasis on contemporary cystectomy series.

**Results:** Despite the fact, that urinary diversion is commonplace in these days and the existing literature is rather extensive, the vast majority of assumptions are based on low level evidence (retrospective, single-institutional case series with small sample sizes and short-term followup). There are few randomized trials in this field.

Early and late surgical complications following radical cystectomy have decreased over the past three decades for both incontinent and continent diversion, but are still significant. While metabolic disturbances are common after continent forms of urinary diversion, the problems can be minimized in most cases. Most reports testify that QOL is high after cystectomy irrespective of type of urinary diversion although urinary and sexual problems are common.

**Conclusion:** Careful patient selection, strict adherence to proper surgical technique and appropriate life-long follow-up are of paramount importance in the successful management of patients undergoing radical cystectomy for bladder cancer.

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**Keywords:** Radical cystectomy; Urinary diversion; Urinary reservoirs, continent; Complications; Metabolic consequences; Quality of life

## 1. Introduction

At first sight, it seems inevitable that there should be a link between complications of any kind and quality of life (QOL) after urinary diversion. However, a second look may reveal that these two concepts overlap to a certain degree, but are very different in principle. It may be both surprising and disappointing, that traditional objective surgical complications are not necessarily reflected by subjective changes in QOL with potential clinical relevance.

In intestinal urinary diversion after cystectomy for malignant disease, one may arguably distinguish

between *functional consequences* of radical pelvic surgery (risk of incontinence and sexual dysfunction), *surgical complications* (e.g. ureterointestinal and stomal stenosis, reservoir rupture, insufficiency of the constructed continence mechanism) and *metabolic consequences* of artificially combining two extremely different organ-systems.

One would assume that the nature, severity, duration and, above all, perception of a complication/consequence determine the effect on QOL. A major but 'silent' complication like upper urinary tract obstruction with subsequent deterioration of renal function may not have the same impact as incontinence, as it does not interfere with daily life unless it is detected and communicated at follow-up. While night time incontinence may be more frequent in patients with neobladders than in patients with ileal conduit diversion,

\* Corresponding author. Tel. +49 931 210 32012;  
Fax: +49 931 201 32013.

E-mail address: Gerharz\_E@klinik.uni-wuerzburg.de (E.W. Gerharz).



the same phenomenon may cause greater distress in the latter [1]; the overall QOL may still be high in both groups. While the inability to insert a catheter into a continent cutaneous reservoir may result in acute panic, it is doubtful whether this life-threatening problem has a lasting impact on QOL once it has been solved appropriately.

As most QOL studies in urinary reconstruction were conducted to compare different forms of diversion rather than to evaluate the effect of particular complications on QOL, this review will deal with these issues separately.

## 2. Diversion-related surgical complications

Despite the fact that ileal conduit diversion still is the most commonly performed type of reconstruction in conjunction with cystectomy, most reports on early and late complications after urinary diversion during the last two decades have focused on those that follow continent reconstruction. Specific surgical complications can be broadly divided into those related to reservoir, efferent (stoma, continence mechanism) and afferent limb (uretero-intestinal anastomosis). The different types of urinary diversion have unique characteristics predisposing to certain surgical complications as well as similarities related to intestinal surgery [2]. In several large series with various length of follow-up, the early and late reoperation rates for complications following continent cutaneous and orthotopic urinary diversion have been reported to be 3–7% and 13–30%, respectively [3].

For review of ileal conduit complications see [4]. Comparison between series of cystectomy with ileal conduit diversion, continent cutaneous diversion or orthotopic bladder substitution must be viewed cautiously as the patient characteristics differ. However, some series suggest that there are no major differences with regard to early complications between these groups. The most frequent long-term complications after conduit diversion are stomal/peristomal problems, parastomal hernia, conduit stenosis and upper tract deterioration. The incidence of these correlate with length of follow-up [4].

Peristomal dermatitis is almost always caused by urine trapped between the appliance and the skin. Stomal and parastomal complications reached 50% in some old series and even recently published series present figures around 30%.

Peristomal hernia is seen in 5–15%. They are rather large than small and although the majority of patients are asymptomatic some need surgery. High recurrence

requiring reoperation is seen. For first-time parastomal hernia repairs, stoma relocation is probably superior to fascial repair. We have seen infections with erosions and fistulas using synthetic mesh, which usually is employed in recurrent hernia repair. Newer techniques with incision placed lateral and far away from the stoma with closure of the fascial defect and using mesh material as onlay have been reported to give good results.

Conduit stenosis is a condition affecting ileal conduits. It has never been described in colonic conduits. The whole, or part of the conduit, is transformed into a thick-walled tube without peristaltic activity. The pathogenesis of this disorder, which manifests late after diversion, is obscure. The clinical picture is colicky flank pain and/or fever and is produced by upper urinary tract obstruction. Treatment is by removal of the conduit or partial resection with or without ureteric reimplantation.

### 2.1. Uretero-intestinal stenosis (afferent limb)

All types of anastomosis, refluxing or non-refluxing, can predispose to certain specific complications. It is generally thought that non-refluxing techniques are associated with a higher rate of uretero-enteric stricture. To date, however, studies evaluating the different anastomotic techniques that are well designed, prospective, and randomized, with appropriate numbers and long term follow-up have not been performed. Meanwhile there is an ongoing intense debate on the pros and cons of refluxing versus antirefluxing anastomosis especially with regard to orthotopic substitution.

For conduit diversion, most often a direct end-to-side refluxing anastomosis is used. In the series by Madersbacher of ileal conduit patients followed for at least 5 years, 10% of the patients developed stenosis of the ureterointestinal anastomosis [4].

A large series with over 350 patients who received a Hautmann neobladder with a Le Duc anti-refluxing anastomosis had an uretero-enteric stricture rate of 9.3% at average follow-up of 54 months [5]. In a series of 166 Kock ileal neobladders where the uretero-enteric anastomosis was performed with a refluxing end-to-end Wallace technique, the stricture rate was only 0.6% with follow-up of 2.7 years [6]. Abol-Enein and Ghoneim reviewed over 300 patients who received a Hautmann neobladder with an anti-refluxing serous lined extramural tunnel technique and reported a 3.8% rate of stricture with unspecified follow-up [7]. A recent series examined 130 patients who received either a Studer or Hautmann neobladder with a refluxing end to side Bricker anastomosis performed and found only 3 uretero-enteric strictures at a mean fol-

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