

The abdominoperineal resection for rectal cancer, which was performed in the late 90's of the 19th century by Quénu and Hartmann marked the beginning of modern rectal cancer surgery. In those days, without flexible endoscopy and without any reliable imaging methods, most rectal tumors would be regarded as late stage locally advanced cancers nowadays. Without modern combination treatment still most of the patients would die from a recurrence. Still, for the first time in history, some patients could be cured and survive and not all would die of local recurrence with or without progressive systemic disease. Only a couple years earlier, Billroth the founding father of gastro-intestinal surgery had proclaimed, that rectal cancer could not be cured by surgery. The publication of Miles on abdomino-perineal resection in the *Lancet* in 1907 is considered one of the most important milestones for rectal cancer surgery. Since then, several technical advances have been made. It became possible to perform anastomoses, in the beginning mostly above the peritoneal reflection, after the introduction of mechanical staplers it became possible to construct anastomoses below the peritoneal reflection and even to the level of the anorectal canal. However, even at the end of the 20th century survival rates were poor, local recurrence rates were high up to 40% and many of the patients died after developing metastatic disease, if they did not develop local recurrence, which would kill them.

Surgery of rectal cancer received an enormous boost by the ground breaking work of Heald, who introduced the concept of total mesorectal excision. The concept was not new, and was already known from many other tumours, however the understanding of the exact anatomy of the rectum, its enveloping mesorectal fascia and the bordering parietal pelvic fascias, which had already been described by Waldeyer around the turn of the century in 1900, made it possible to develop a new surgical technique, which respects these fascias. An important paradigm shift was the realization that it is not the tumor, which determines the outcome of rectal cancer surgery, but it is the quality of surgery itself. By doing better surgery local recurrence rates could be dropped below 10%, and even lower, below 5%. However this was not the only change that took place. More potent magnetic resonance imaging devices (MRI) were developed, and they made it possible to delineate fascial layers within the soft tissue. For the first time the surgeon was not blind, but could anticipate on the extension of the tumour, and could realise where a resection would be troublesome, and could lead to a positive resection margin, which is still a very poor prognostic sign. No longer the final pathologic specimen guided additional therapy, but instead, the preoperative image, which corresponds very well with the final pathology, made it possible to make treatment decisions beforehand. Preoperative treatment on the basis of preoperative imaging is now generally accepted.

Preoperative radiotherapy did enable to shrink the tumour to such an extent that even in tumours, which were thought to be irresectable a resection could be performed. No longer rectal cancer treatment was the domain of the surgeon alone. Preoperative radiotherapy and intensification of preoperative radiotherapy with concomitant chemotherapy became an important part of the treatment. Postoperative radiotherapy has been discarded almost completely in the management of rectal cancer, and probably the same will be true for postoperative adjuvant chemotherapy.

New approaches to systemic treatment in rectal cancer are being investigated. Administering preoperative systemic treatment seems very promising as a down-staging modality, almost comparable to preoperative radio-chemotherapy. However, a possible advantage of preoperative chemotherapy could be that not only there will be a local effect on the tumour, but may be also microscopic metastases can be treated, before any surgery is being performed.

In this highly recommendable book, new trends in research and developments in management on rectal cancer are being discussed.

Optimal use of the available imaging modalities like MRI, CT and PET are reviewed in the first chapter. These modalities are truly complimentary displaying their strengths in local and distant staging of patients with rectal cancer. In the next section on treatment overview, eminent authors stress that modern rectal cancer treatment is unthinkable without a multidisciplinary approach and corresponding multidisciplinary team working in "concert" to decide on the best sequence and combinations of treatment.

In the next part of this book, it is pointed out that surgery still plays a major role. New surgical techniques are still being developed looking for less traumatic surgery and fewer complications. Laparoscopic and even robotic surgery have found their way to the operating theatre. The next section raises an important issue regarding the use of systemic therapy. In a later chapter an overview of all studies on adjuvant chemotherapy is provided, but in these chapters it is discussed if in the era of neo-adjuvant treatment the use of preoperative chemotherapy is much more effective than postoperative chemotherapy? The same fate as is shown for postoperative systemic treatment has already become true for postoperative radiotherapy, which has been replaced by preoperative radiotherapy. Nowadays, it is not possible to talk about neoadjuvant treatment

without radiotherapy. In small rectal cancers, high doses of local radiotherapy may replace surgery. Further intensification of radiotherapy by means of an intraoperative boost or the use of proton beam radiotherapy may also help to optimize outcome in more locally advanced or even locally irresectable tumors. It is accepted that radiotherapy with concomitant chemotherapy results in downsizing and downstaging of a rectal tumor. The work of Habr-Gama has brought this concept to a higher level. She has shown that after complete response after chemo-radiation even in advanced cases organ preservation has become a realistic option for a substantial number of patients. Many questions regarding prediction of response and optimal selection of patients for a possible organ preserving approach remain open, but they also demonstrate how far we have come since the first successful abdomino-perineal resection at the end of the 19th century.

Concluding:

In order to achieve an optimal treatment of rectal cancer patients many specialties have to collaborate. The sequence of different treatments will become an important issue and these patients best can be discussed in the multidisciplinary tumour board. A good registry is necessary to combine data of best practices within countries and to combine data from international institutes. These data will enable to produce guidelines from which everyone can benefit. The authors of the chapters in this book demonstrate state of the art research and help to identify future questions, which still remain to be resolved.

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