

BACKGROUND AND AIMS

Intraoperative Radiation Therapy (IORT) seeks to enhance local control by administering, during surgery, a high single dose directly to the tumour bed or on a non-resectable tumour, while moving and protect the sensitive structures, thereby enabling dosages to be raised without increasing related toxicity.

The aims of this systematic review were to assess the effectiveness of IORT boost for the conventionally treatment of colorectal cancer, in terms of recurrence, survival and impact on quality of life, and to ascertain the safety in terms of acute and late toxicity.

METHODS

Bibliographic search: from January 2000 to August 2013, in:

- Centre for Reviews and Dissemination
- Cochrane Plus Library
- Medline
- Embase
- ISI Web of Knowledge
- CIBIC-Incisa Medico Español
- Clinical Trials Registry
- WHO International Clinical Trials Registry Platform
- Current Controlled Trials
- a general search of quality internet web pages to locate grey literature

Selection papers: two independent reviewers in accordance with pre-established inclusion and exclusion criteria, with any disagreements being resolved by consensus. Manual review was performed of the bibliographic references cited in the papers selected.

Data extraction: were summarised in evidence tables. Study quality was assessed using the SIGN scale.

RESULTS

- 20 REPORTS:
- 2 RCT
 - 1 pooled analysis
 - 17 case series



Locally Advanced Rectal Cancer (LARC)

Clinical trials: didn't show any significant improvement over controls in terms of efficacy and survival, with local control and overall survival rate of 90%-92% and 64%-70% at 5-year respectively.

Observational studies: low local recurrences rate of 2%-19%, local control in excess of 90% and overall survival from 52% to 82%.

Study	N	LC (%)	R (%)	OS (%)	OS (5y)	OS (10y)	OS (15y)	OS (20y)	Mortality	
RCT	72	88	91.8	92.8	6.9	9.8	11	20	74.8	83
	20	27	99.1	98.0	11	11	29	32	64	58
Pooled	99	62	98	84	3	16	20	29	58	1
Case series	328	94	9.6	18	92	18.8				
	238	—	6.0	—	80	23.8				
	146	86	19	47	52	59				
	245	92	7	5	69	—				
	115	94	6.0	21	74	4.5				
	100	84	3	12	65	23				

Locally Recurrent Rectal Cancer (LRRC)

Effectiveness

- 5-year recurrence rate: 30-46% and 5-years local control rate: 44-68%.
- Overall survival ~43% at 5-year, with results being broken down by resection margin status (R0:46%-63%, R1:26% and R2:0%-24%).

Safety

No increase was observed in either LARC or LRRC disease.

Toxicity:

- None of the RCT detected significant differences between the two types of treatment, though IORT patients developed greater overall toxicity, with certain complications not observed in the controls.
- Frequent complications: surgical wound (infection, abscess, anastomotic leakage), gastrointestinal, urethral obstruction and peripheral neuropathy.

N	LC (%)	R (%)	OS (%)	OS (5y)	Mortality
607	Total: 68 R0:79	42	53	Total: 30 R0:46	<1
147	Total: 57 (5y) R0:75	43 (5y)	—	Total: 43.8 (5y) R0:59	8.2 (3 months)
107	44 R0:78	Total: 30 R0:50	—	Total: 30 R0:43	0
65	Total: 68 R0:78	29 (5y)	46 (5y)	39	27.7
60	44	46.6	47	43	66.7

CONCLUSIONS

Efficacy:

- ✓ IORT's association with combined treatment of LARC reporter that, while this association achieves good results, it does not amount to an increase in effectiveness and overall survival, or to a significant reduction in safety regard to conventional treatment.
- ✓ Depending on the status of the edges of resection, shown greater benefit in patients who undergo incomplete resection compared with complete resection.

Safety:

- ✓ IORT does not increase the complication rate, displaying comparable short- and long-term complications.
- ✓ A matter for concern is the higher incidence of adverse effects related with the surgical incision and the appearance of complications that do not arise in controls.

In the case of recurrent disease, the available evidence is, not only of low quality, but is far less abundant.

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