

“COMBINED RADIOTHERAPY AND CHEMOTHERAPY IN THE TREATMENT OF CANCER”

José María López Tobaruela

KEY POINTS:

- **Radiotherapy:** local treatment
- **Chemotherapy:** systemic treatment
- **Combined radiotherapy and chemotherapy:**
 - Local and systemic control of cancer
 - Effects increase
 - Problems: very new treatment, toxicity, etc.

RADIOTHERAPY (RT)

- **Local** effect
- Irradiation to destroy cancer cells
- **Modalities:** external, interstitial, intracavitary, metabolic
- Division of RT doses to get better results and to reduce toxicity
- Damage in adjacent healthy tissues
- **New modalities:** radiosurgery, shaped RT



CHEMOTHERAPY (CTX)

- **Systemic effect**
- **Many mechanisms of action:** DNA alkylating, topoisomerase inhibitors, antimetabolites...
- Eradicate **micrometastasis** focus
- **Lot of adverse reactions:** alopecia, pancytopenia, digestive disorders...



COMBINED RT+CTX: GOALS

- Better local tumor control
- Increase overall survival and disease-free survival
- Avoid relapses

COMBINED RT+CTX: STRATEGIES:

- **Sequential:** classic method:
 - Neoadjuvant (CT pre-RT)
 - Adjuvant (QT post-RT)
- **Alternating**
- **Associated:** CT and RT at the same time. More efficiency, more toxicity

COMBINED RT + CTX: MOST COMMONLY USED DRUGS¹

- **Platinum salts** (synergistic effect)
- **5-fluorouracil** (additive effect)
- **Mitomycin C** (action on hypoxic cells)
- **Hydroxyurea** (synchronise cells on G2 phase)
- **Biologic therapies** (on research)

COMBINED RT + CTX: INDICATIONS¹

- **Inoperable cancers** (head and neck, bronchi, esophagus, etc.)
- **Preoperative:** to obtain resectability, downstaging and/or less mutilating conservative surgeries (larynx, stomach, pancreas, etc.)
- **Postoperative:** reduce local relapses and distant metastasis, increase survival (for example, rectal cancer)

COMBINED RT+CTX: ADVANTAGES

- **Spatial summation:** systemic and local interventions, eradicate cancer and metastasis
- **Additivity**
- **Supraadditivity:** both methods are more effective together than separately
- **Reduced radiation damage** to normal tissue

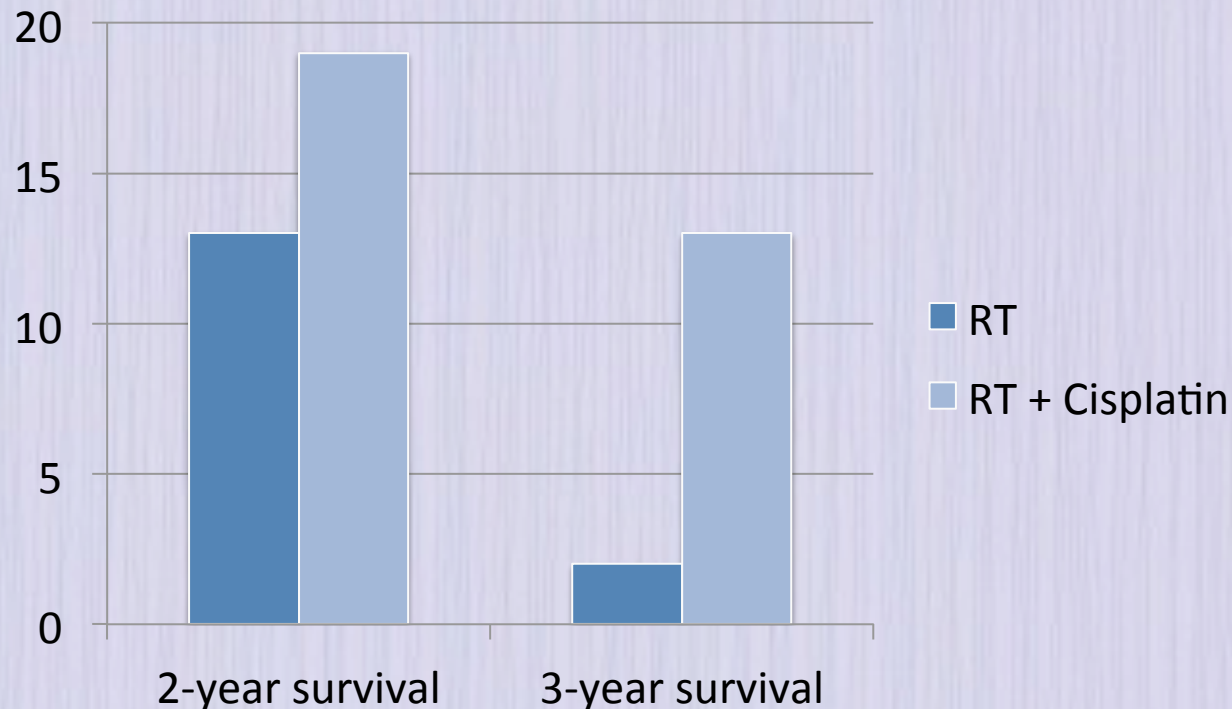
COMBINED RT+CTX: **PROBLEMS**

- Choosing the most appropriate drug
- Suitable radiation scheme
- Toxicity
- Supportive care
- Identification of appropriate moment to implement
- Patient selection criteria

EXAMPLE:

“Radiotherapy combined with chemotherapy in the treatment of lung cancer”:²

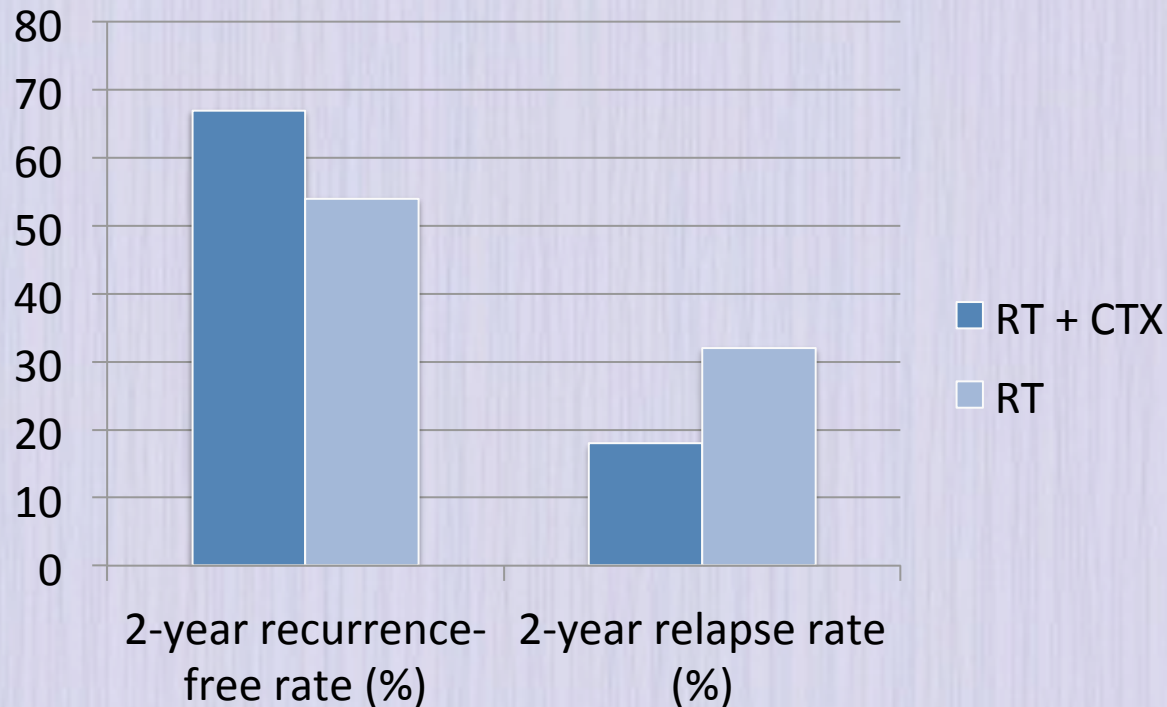
Benefit in local control and increased survival compared to single treatments.



EXAMPLE:

“Radiotherapy with or without Chemotherapy in Muscle-Invasive Bladder Cancer”:³

Improvements were seen in locoregional control compared to radiotherapy alone



BIBLIOGRAPHY

- 1: Herrera A, Granados M. *Manual de Oncología. Procedimientos médico quirúrgicos*. México: McGraw-Hill; 2012.
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- 3: James N, Hussain S, Hall E, Jenkins P, Tremlett J, Rawlings C et al. Radiotherapy with or without Chemotherapy in Muscle-Invasive Bladder Cancer. *N Eng J Med*. 2012; 366: 1477-1488. Disponible en: <http://www.nejm.org/doi/full/10.1056/NEJMoa1106106#t=article>

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