



# Surgery for octogenarians: the secret is in the selection

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In the last decades, almost worldwide, mean age of people has increased due to better life conditions and a general improvement of healthcare (1). This slow but constant social change is particularly true in western world and oblige National Health Care systems to face new challenges from an economical, ethic and healthcare point of view. As a matter of fact, age has become a relative contraindication rather than absolute and, as a result, the age of people that are candidate to complex surgical procedures in all branches of oncological surgery is constantly increasing (1-3).

Quite obviously a careful overall evaluation of the patient's overall condition is crucial. A comprehensive cardiac, pulmonary and anesthesiological risk assessment is fundamental.

Peng and colleagues (4) analyzed data from the Surveillance Epidemiology and End Results (SEER) database to elaborate a risk model to better stratify patients over 80 years old and their outcomes after lung surgery. Authors selected all the patients over 80 years who were diagnosed with lung cancer and they divided the cohort based on surgical or non-surgical treatment; they firstly created a propensity score match to evaluate overall survival (OS) and cancer specific survival (CSS) in the two subgroups. Over a total of 14,264 eligible patients, 4,475

underwent a surgical resection. OS and CSS resulted significantly better in patients who received a surgical approach both before and after propensity-score matching ( $P < 0.0001$ ). Independent prognostic factors influencing OS and CSS were surgical approach, gender, tumor grade, T factor, N factor and M factor, radiotherapy and chemotherapy. Based on these results and on the median value of CSS in the non-surgical group, authors build a nomogram including all the overmentioned independent prognostic factors to verify the subgroup who might benefit the most from a surgical approach (beneficial and non-beneficial group). As a result, patients who were selected in the beneficial group undergoing surgery had a significantly better CSS compared to those who were in the non-beneficial group and received surgery. No significant difference was found between the CSS of non-surgical group and the non-beneficial group who were operated. The CSS benefit between beneficial and non-beneficial group was significant also when patients were stratified according to the type of resection received (lobectomy, segmentectomy or wedge resection).

Several studies faced the issue of surgery in octogenarians: these patients are generally frailer and with reduced life expectancy, which bring to a higher complication rate (up

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to 30%) and an increased procedure-related mortality (2,5,6). It is therefore of paramount importance not only to evaluate the potential risk of intra and postoperative risk, but also to correctly focus the goal of surgery and to balance life expectancy and maintenance of quality of life (7). In a systematic review Blanchard and her coworkers (1) find that most of the studies agree that surgery can be offered also to patients over 80 years, but they must be selected according to their comorbidity and performance status; on the other hand, a real, precise and reliable assessment is difficult and the available tools [e.g., Charlson Comorbidity Score, Eastern Cooperative Oncology Group Performance Status (ECOG PS) scale] cannot always give a right insight of potential risks and a clear prognosis (7).

From a surgical point of view, results of several papers remark the importance of the extent of surgery which should include lobectomies or sublobar resections, while pneumonectomies should be possibly avoided in this subset of patients (1). On the other hand, extent of resection is often strictly related to T or N status. A multicentric study run by our group showed that acceptable results can be obtained also in elderly patient who underwent pneumonectomy (8); of note, the median age of the cohort was 73 years and octogenarians were a small proportion of the whole population. Nevertheless, on over 80-year-old patients the prognostic impact of a lobectomy might not be the same of a younger population and sublobar resection should be preferred when possible (1).

Surgery is anyway rapidly evolving and minimally invasive solutions (either video-assisted thoracic surgery or robot-assisted thoracic surgery) are quickly becoming the standard not only for early stage tumor resections, but also for more complex cases. The advantages of minimally invasive surgery, together with Enhanced Recovery after Surgery (ERAS) protocols are well known and they allow a faster recovery, earlier mobilization and a shorter hospitalization that are what is specifically needed in particular for older and frailer patients (2). Recently, Chen and colleagues (9) retrospectively analyzed the impact of non-intubated thoracoscopic lung resection compared to intubated procedures in over-75 patients: despite a higher total number of complication and in hospital stay, these differences were not significant; authors conclude that non-intubated surgery should be considered a good option in case of frail patients who might be candidate to surgery.

Nevertheless, the whole standards of care are changing. Immunotherapies and target therapies are now offered in

different setting and might bring to a switch in the current standards also for frailer and over 75 patients. On the other hand, in older patients, the activity of immunotherapy might be reduced due to immunosenescence and they might experience a higher rate of adverse event. For this reason, also for new generation systemic therapies, octogenarians should be carefully selected (10). Unfortunately, most of the data on outcomes of octogenarian patients mainly rely on retrospective cohort and this subset of population is often excluded or scarcely included in clinical trials, which prevent clear and definitive conclusions on the real role of surgery or other treatments (1,9).

In conclusion, in octogenarian surgery can be safely offered when a clear balance of life expectancy and quality of life shows a potential benefit. Preoperative tools that help to stratify the risk assessment can provide a further insight in this topic. Nevertheless, although improvements in surgical techniques, anesthesiology and postoperative care have made surgery safer and less invasive for all patients, included the older ones, dedicated prospective studies might allow more precise selection criteria to stratify patients who will benefit the most from surgery.

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