

# Could there be a relationship between type of anesthesia and oncological parameters after transurethral resection of bladder cancer?

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Cancer progression can be affected by a number of factors that cannot be totally explained. Growing evidence in the literature reports that, among various parameters, type of anesthesia and perioperative pain control may alter prognosis of different type of cancers (1-4). In their article, Koumpan *et al.* showed that patients with the diagnosis of non-muscle invasive bladder cancer (NMIBC) who underwent transurethral resection of bladder tumour (TURBT) under spinal anesthesia had lower recurrence rates and delayed time-to-recurrence compared to the ones who were offered the same procedure under general anesthesia (5). No difference was found between the two groups in terms of disease progression to muscle-invasive stage and overall mortality. Authors used multivariable logistic regression and Cox proportional hazards ration model to assess the association between anesthetic type and recurrence and time to recurrence, respectively.

Based on the description of methods, both models controlled for the receipt of any adjuvant treatments after TURBT and the bladder cancer risk classification. Further sensitivity analysis of the study sample stratified by risk group revealed that the association between anesthesia type and recurrence parameters heavily relied on the data of patients who belonged in the high-risk group. Interestingly, while patients who were offered general anesthesia were younger and with less comorbidities [based on American

Society of Anesthesiologists (ASA) classification], their recurrence parameters were worse.

Authors tried to explain their interesting findings by proposing several different mechanisms that included the effect of volatile agents on immune system and cancer cell proliferation, and the attenuation of stress-induced immunosuppression and resulting cancer immune escape offered by the use of regional anesthesia. Moreover, the *in vitro* anticancer effect of regional anesthesia agents has been described, while the use of opioids after general anesthesia to control pain has been proven to be implicated in immunosuppression and pro-angiogenic pathways.

The relationship between anesthetic technique and cancer parameters remains unclear as various studies have presented conflicting results on survival parameters after general versus regional anesthesia in patients with colorectal, ovarian and prostatic malignancies (1-3,6,7). With respect to bladder cancer, and in contrast to Koumpan *et al.* study findings, a retrospective analysis of data from a mixed set of patients with muscle- and NMIBC by Jang *et al.* revealed no significant relationship between recurrence rates and type of anesthesia (8). However, a recent study by Choi *et al.* in patients with NMIBC revealed lower recurrence rates in the spinal anesthesia group versus the general anesthesia one, a finding which is similar to the one presented by Koumpan *et al.* in their study (9).

However, the limitations of the Koumpan *et al.* study should also be highlighted. As a retrospective observational study, it suffers from various types and degrees of bias. Therefore, and due to the internal methodological limitations, the overall quality of evidence is deemed to be low, and thus, no clear recommendations on clinical practice could be provided based on this study. Moreover, even though authors used specific NMIBC-related parameters as covariates in their statistical models, it is possible that unknown variables, other than the ones explored in this study, could act as potential confounders that could influence recurrence parameters.

Nevertheless, Koumpan *et al.* study results reveal a trend that cannot get easily overlooked. Bladder cancer is a common malignancy in adults and recurrence and progression represent major characteristics of the NMIBC natural history. Therefore, any surgical or non-surgical intervention that could improve recurrence parameters should be further examined. Whether the type of anesthesia at the time of TURBT could be regarded as one of these interventions remains unclear. Therefore, prospective and randomized controlled trials adequately powered and properly designed to evaluate the possible relationship between TURBT anesthesia type and NMIBC recurrence and progression parameters should be conducted in the future.

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## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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