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Commentary

Intravesical Immunotherapy: An Innovative Treatment for Bladder Cancer

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ABOUT TO STUDY

Bladder cancer is one of the most common cancers, particularly in older adults, with its most frequent form being Transitional Cell Carcinoma (TCC). The treatment for bladder cancer depends on the stage and grade of the disease, but one common challenge is the recurrence of cancer after initial treatment. For patients with Non-Muscle Invasive Bladder Cancer (NMIBC), which accounts for approximately 70-75% of all bladder cancer diagnoses, the primary treatment often involves surgery, such as Transurethral Resection of the Bladder Tumor (TURBT), followed by intravesical therapy.

Awareness on intravesical immunotherapy

Intravesical immunotherapy is a method of delivering medication directly into the bladder through a catheter. This localized treatment is particularly effective for non-muscle invasive bladder cancer, aiming to prevent cancer recurrence and progression after surgery. Unlike systemic treatments that affect the entire body, intravesical therapy focuses on the bladder, minimizing side effects while directly targeting the tumor cells within the bladder lining.

Immunotherapy, in the context of bladder cancer, works by stimulating the body's immune system to recognize and attack cancer cells. Intravesical immunotherapy has gained significant attention due to its ability to improve long-term outcomes for patients with superficial bladder cancers, particularly in preventing recurrence, which is a major concern for this patient population.

Types of intravesical immunotherapy

There are several types of intravesical immunotherapy agents, with Bacillus Calmette-Guérin (BCG) being the most widely used and studied. BCG is a live, attenuated strain of Mycobacterium bovis, originally developed as a vaccine for tuberculosis. It is now used in the treatment of NMIBC because of its ability to trigger a strong immune response. When instilled into the bladder, BCG stimulates the body's immune system, which recognizes the cancer cells as foreign and mounts an immune attack against them.

Other immunotherapy agents are being explored as well, including immune checkpoint inhibitors such as nivolumab (Opdivo) and atezolizumab (Tecentriq), which have gained attention for their ability to enhance immune responses against cancer. These therapies, however, are still largely used in advanced bladder cancer and are not as common in intravesical therapy for NMIBC.

Role of intravesical immunotherapy

The process of intravesical immunotherapy begins with a catheter insertion into the bladder, through which the medication is instilled directly. After the treatment, patients are generally advised to retain the medication in the bladder for a certain period to ensure adequate absorption before urinating. The immune-stimulating effect of BCG, for instance, is thought to involve several immune system components. Upon entering the bladder, BCG interacts with the urothelial cells lining the bladder, activating immune cells like T-cells and macrophages. This local immune response helps to destroy the cancerous cells in the bladder lining and also helps to trigger systemic immunity, which may contribute to longer-term protection against recurrence.

Side effects and considerations

While intravesical immunotherapy is a promising treatment, it does have potential side effects. The most common side effects of BCG therapy include bladder irritation, which may manifest as urinary urgency, frequency, dysuria (painful urination), or hematuria (blood in the urine). In rare cases, more serious complications such as systemic infections, fever, or even sepsis can occur. These risks necessitate close monitoring during treatment, especially after the first few treatments.

For patients with contraindications to BCG (e.g., those with compromised immune systems), alternative therapies may be used. Newer therapies, such as immune checkpoint inhibitors, are being investigated, and while they show promise, they are often reserved for more advanced stages of bladder cancer.

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CONCLUSION

Intravesical immunotherapy, particularly with BCG, has become a cornerstone in the management of non-muscle invasive bladder cancer, offering patients an effective treatment option to reduce recurrence and progression. By stimulating the body's immune system to target cancer cells, this approach has improved outcomes for many patients. While it does have some associated risks and side effects, the localized nature of the therapy ensures that it remains a favorable option compared to systemic treatments. Ongoing research into newer immunotherapy agents and their combination with BCG continues to hold promise, and as technology and techniques evolve, the future of intravesical immunotherapy appears even more promising. For many patients with NMIBC, this treatment provides a lifeline, potentially sparing them from more invasive procedures and improving their quality of life.