Epigenetics and colorectal cancer

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Colorectal cancer (CRC) is the third most common cancer in the world. This disease is the forth most common cancer in Iranian men and the second among women. CRC has become one of the deadliest and also one of the most avoidable cancers. Colorectal cancer death rates have been declined in developed countries probably due to increased use of available screening tests as well as encouraging a healthful diet and exercise. Sporadic colorectal cancers account for about 70% of all CRCs. This malignancy starts in the cells of colon or rectum and majority of them are adenocarcinomas. It has been suggested that CRC results from a sequential genetic and epigenetic changes in colon or rectum epithelial cells. Sequencing studies have shown that the evolution of most conventional adenomas into carcinomas is through chromosomal or microsatellite instabilities as well as aberrant DNA methylation and DNA repair defects. Somatic mutations in APC, TP53, PIK3CA, PTEN, KRAS, ATM, SYNE1, SMAD4, KIT, and BRAF genes are among the most common mutations in sporadic CRC. New potential driver mutations also found in ARID1A, SOX9, and FAM123B/WTX.

Meanwhile, recent study underscored the DNA replication/instability cause of heritable CRC. Although CRC mutational landscape and expression profiles have been studied extensively, CRC epigenetics landscapes and the potential molecular consequences have not been comprehensively described. The most comprehensive available datasets on colorectal cancers reveal the correlation between epigenetics and mutational landscapes in CRC. The epigenetics information can be used to predict prognosis and response to personalized treatment in CRC patients.

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Staging Imaging and Response Assessment in Rectal Cancer

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After a brief introduction, pelvic MRI technical protocol to stage rectal cancer will be discussed. The relevance of structured reporting will be addressed, as well as the multiple findings to be included. The role of MRI in response assessment after neoadjuvant therapy will follow and include the corresponding structured report. What is new in rectal cancer imaging followed by some concluding remarks will end the presentation.