Positive Surgical Margin after Radical Prostatectomy? What does it mean?

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When a surgeon removes a tumour, they will remove a thin layer of apparently non-cancerous tissue surrounding the tumour. The purpose of this is to ensure that all of the cancer is removed. Pathologists examine this outer layer of tissue, and if cancer cells are present to the edge of the removed tissue, they will report a positive surgical margin, or PSM.

Your surgical margin, whether positive or negative, will help you and your doctors to determine what to do next in treating your cancer, with an aim to ensure complete eradication of tumour cells in your body.

What is a positive surgical margin in prostate cancer?

A radical prostatectomy is a surgical procedure to remove all or a part of the prostate gland. As a treatment for prostate cancer, the goal is to remove all of the cancerous tissue, so a small amount of the surrounding tissue is also often removed. The removed tissue is then sent to a pathology laboratory for evaluation.

When the pathologist receives the prostate tissue, they will carefully examine it and measure its size and weight. Then they paint the different surfaces of the prostate with different coloured ink before carefully and systematically dissecting it. Each piece is then sliced very thinly and stained with histological stains so that the cells can be clearly seen under a microscope. The ink that was painted onto the edge of the prostate can also be seen and this helps the pathologist know which part of the prostate the sample came from. This coloured ink marks the outside edges of the prostate gland and is known as the surgical margins. If the cells close to the ink mark are not cancer cells, then the tumour is said to have negative surgical margins, but if the cancer cells extend to the ink line at the edge of the prostate tissue the margins are considered positive.
What does it mean to have a positive surgical margin (PSM)?

A positive surgical margin (PSM) after radical prostatectomy occurs in around 10-31% of cases, so researchers are very interested in understanding the clinical importance of a PSM.

A team of scientists and doctors in Norway recently published a paper examining the effect of PSMs on patient outcomes. The paper can be viewed here. In this study, the researchers examined the medical records kept in the Cancer Registry of Norway of 14,837 men who had a radical prostatectomy between 2001 and 2015. Of these men, 13,198 had complete information available from their time of surgery which included their PSA levels before surgery, pathological T-category (a marker of cancer size and if it has spread outside of the prostate), Gleason score in the removed prostate tissue and the margin status (positive or negative). The registry also kept information on which men relapsed, what treatments they were given and the outcome of their disease. This allowed the researchers to compare the men’s treatment and outcome with the prostate cancer information collected when the men had their prostatectomies.

Before prostatectomy the median PSA levels for the men was 8.1. Of the 13,198 men 3,478 (26.4%) of them had a PSM the rest had negative surgical margins (NSM). PSMs were more common in men who had their prostatectomies in the years 2001-2003 with 39.4% having a PSM compared to 23.0% in 2013-2015. They were also more common in men who had pre-surgery PSA levels of more than 20 with 45.8% of these men having a PSM while 21.8% of men with a PSA of less than 10 had a PSM. Similarly, PSMs were more common in cancers with higher Gleason scores than with lower scores; 19.8% of men with Gleason score 6 tumours had PSMs compared to 43.7% of men with Gleason score tumours of 9-10.

When the researchers followed up what happened to the men by 10 and 15 years, they found that a total of 2112 (16%) patients needed further treatment after their radical prostatectomy with 1 in 3 men with PSMs needing further treatment compared to 1 in 10 men with NSMs. These men either received radiotherapy soon after treatment (adjuvant radiotherapy) or treatment later when their tumours recurred (palliative radiotherapy). The study found that men with a PSM were more likely to need further treatment, particularly if they had a more aggressive disease characteristics at the time of surgery (eg high PSA, high Gleason score and higher pathological stage).
The researchers found that PSM alone was not enough to predict a higher risk of death for men with prostate cancer. Instead there was a higher risk of death if the men had a PSM as well as more aggressive disease characteristics at the time of radical prostatectomy.

Overall the researchers found that men who had PSMs were more likely to need further treatment, but only those who had more aggressive disease characteristics had a higher risk of dying from prostate cancer.

**What if you have a positive surgical margin?**

If your pathology report comes back showing a PSM, don’t be alarmed – sometimes PSMs are false positives. Your doctor or specialist will examine your Gleason score, the size of your tumour and any spread of your tumour beyond the prostate in order to determine your treatment options and make any recommendations in discussion with you. Many men also consult a PCFA Prostate Cancer Specialist Nurse to help understand the different treatment pathways and possible side-effects. For more information, the [Johns Hopkins Medicine](https://www.johns_hopkinsmedicine.org) website has a very good description of PSMs.