# Ultrasound can predict tumor burden and survival in melanoma patients

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Berlin, Germany: Researchers have shown for the first time that patterns of ultrasound signals can be used to identify whether or not cancer has started to spread in melanoma patients, and to what extent. The discovery enables doctors to decide on how much surgery, if any, is required and to predict the patient's probable survival.

Dr Christiane Voit told Europe's largest cancer congress, ECCO 15 - ESMO 34, in Berlin today: "We have identified two ultrasound patterns of lymph node metastasis in melanoma patients which can identify correctly any amount of tumour cells in the sentinel lymph nodes in 75-90% of cases before proceeding to surgery on the sentinel lymph nodes."

Dr Voit, who is a dermatologist and head of the diagnostic unit at the Skin Cancer Centre at Charité - Universitätsmedizin Berlin, the Medical University of Berlin, Germany, said that although her research needs to be confirmed in multi-centre, randomised clinical trials, it had the potential to spare patients unnecessary surgery, especially if it was combined with ultrasound-guided fine needle biopsy of lymph nodes rather than conventional surgery.

Since 2001 Dr Voit and her colleagues in Germany and The Netherlands have included 850 melanoma patients in a prospective study to investigate the use of ultrasound in diagnosis and treatment planning. They have already demonstrated that ultrasound-guided fine needle biopsy of sentinel nodes before conventional sentinel node surgery can

identify up to 65% of patients in whom the cancer has started to spread. The study presented today shows how far ultrasound patterns correlate with disease progression, tumour burden, survival and prognosis in the first 400 of these patients with stage I/II melanoma and with the longest follow-up.

Before having sentinel node surgery the patients were investigated using ultrasound, and these results were checked against the results of the subsequent surgery. The researchers found that two ultrasound patterns together could correctly identify the amount of cancer cells in the lymph nodes in 80% of cases.

A balloon shape ultrasound pattern with or without loss of central echoes (where the lymph node has lost central echoes or still has some residual central echoes, but these are wandering toward the rim, giving an asymmetrical shape to the centre) was an indicator in up to 83% of cases of a large amount of cancer cells in the sentinel node. "This ultrasound pattern was a late sign, only occurring in cases of advanced metastasis," said Dr Voit.

A pattern of peripheral perfusion (where small blood vessels start to surround the lymph node) was an early sign of a small number of cancer cells present. "The early signs are signs of first disruption of the normal lymph node architecture by an early stage metastasis. The most important one is peripheral perfusion, which shows angiogenesis (the formation of new blood vessels) is occurring," she explained.

The researchers found that these two ultrasound patterns could predict overall survival. Estimates for overall survival after five years for patients with stage I/II is between 50-90% depending on the state of the tumour. Dr Voit found that 93% of patients with neither of these ultrasound patterns, 87% of patients with peripheral perfusion, and 56% of patients with balloon shapes with or without loss of central echoes,

survived for at least five years; survival without cancer spreading to other parts of the body was 74%, 60% and 26% respectively.

Dr Voit said: "For the first time we have established that ultrasound patterns can be used as criteria for diagnosing disease progression and tumour burden. Balloon shaped lymph nodes with or without loss of central echoes and peripheral perfusion are independent prognostic factors for survival."

Discovering if cancer has spread to the lymph nodes is the most important factor influencing the prognosis and treatment of melanoma patients. Doctors usually cut out one or two key lymph nodes, called sentinel nodes, and use these as an indicator of whether or not the cancer has spread to the other lymph nodes. If the sentinel node is free of cancer, patients don't need to have more extensive lymph node removal. However, only 20% of patients who have a sentinel node biopsy have cancer that has spread there, and so the operation, which can be accompanied by side effects such as chronic swelling and seroma, is unnecessary for 80% of patients. Using ultrasound first to detect the presence or not of sentinel node metastases could be a non-invasive way of limiting the numbers of patients who require subsequent surgery or simply watchful follow-up care.

Source: ECCO-the European CanCer Organisation