

Letter to the editor concerning Offersen et al., [Radiother Oncol 2015; 114: 3-10]

With great interest we read 'ESTRO consensus guideline on target volume delineation for elective radiation therapy of early stage breast cancer' by Offersen et al [1]. We wish to congratulate the authors on their excellent work describing easily applicable, comprehensive delineation guidelines.

When applying the author's guidelines, we came across an anatomical error that caused some confusion during the application process. We therefore thought it would be useful to bring this to the reader's attention. As the lateral border of CTVn L1, Offersen et al suggest an imaginary line between the pectoralis major muscle and the deltoid muscle in the more cranial slices. However, in supine position with the arms in elevation, the deltoid muscle will never be located directly lateral from the pectoralis major muscle. This is illustrated by figure 1A (in 2D) and figure 1B (in 3D). As can be seen in figure 1B, no matter how far in cranial direction, there will always be another muscle than the deltoid muscle directly lateral from the pectoralis major muscle. This can either be the muscle bundle containing the short head of the biceps brachii and the coracobrachial muscle (B), the latissimus dorsi muscle (LD), the teres major muscle (T), or the (long head) of the triceps brachii muscle (TB). Based on figure 1A, that shows the most cranial slice containing CTVn L1, it can be concluded that the ventral side of the latissimus dorsi muscle (not the deltoid muscle) should be used together with the major pectoral muscle to create the imaginary line that serves as the lateral border of CTVn L1.

This adjustment also applies to the 'anterior and external' border for CTVn L1 in the PROCAB guidelines by Verhoeven et al. These guidelines were published in the same journal volume [2].

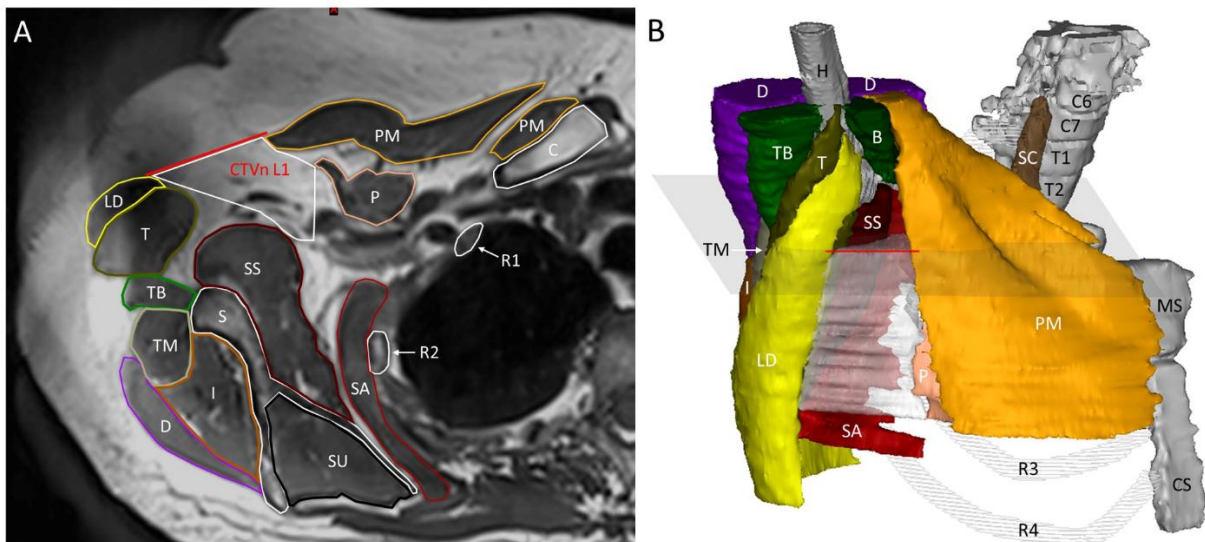


Figure 1. Area of interest for delineating the lymph node target volumes according to ESTRO, presented in 2D (figure 1A) and in 3D (figure 1B). An MRI scan taken from a volunteer in supine position, with the arms in elevation, was used for this figure. The 3D representation was created using Mimics 23.0 software (Materialise, Leuven, Belgium). Figure 1A shows the most cranial slice containing CTVn L1, indicated according to ESTRO. Figure 1B shows the 3D rendering of the same patient. A red line indicating the lateral border of CTVn L1 is drawn at the same location in both figures. The transparent plane in figure 1B corresponds to the level of the axial slice in figure 1A. The colours of the delineations in figure 1A correspond to the colours of the 3D structures in figure 1B. CTVn L1 is shown transparently in figure 1B. Note that the lateral border of CTVn L1 is formed by drawing an imaginary line (red lines in figure) between the pectoralis major muscle and the latissimus dorsi muscle (not the deltoid muscle). B = muscle bundle containing the biceps brachii (short head) and the coracobrachial muscle, C = clavicle, C6/C7 = cervical vertebrae 6 and 7, CTVn L1 = clinical target volume for lymph node level 1, CS = corpus of sternum, D = deltoid muscle, H = humerus, I = infraspinatus muscle, LD = latissimus dorsi muscle, MS = manubrium of sternum, P = pectoralis minor muscle, PM = pectoralis major muscle, R1-R4 = rib 1-4, S = scapula, SA = serratus anterior muscle, SC = scalenus anterior muscle, SS = subscapularis muscle, SU = supraspinatus muscle, T = teres major muscle, T1/T2 = thoracic vertebrae 1 and 2, TB = triceps brachii muscle (long head), TM = teres minor muscle.

Acknowledgements

This project was supported by a special research fund, starting grant from Ghent University.

Grant number: BOFSTG2018002501 (Tom Van Hoof)

References

[1] Offersen BV, Boersma LJ, Kirkove C, Hol S, Aznar MC, Biete Sola A, et al. ESTRO consensus guideline on target volume delineation for elective radiation therapy of early stage breast cancer. *Radiother Oncol.* 2015;114:3-10.

[2] Verhoeven K, Weltens C, Remouchamps V, Mahjoubi K, Veldeman L, Lengele B, et al. Vessel based delineation guidelines for the elective lymph node regions in breast cancer radiation therapy - PROCAB guidelines. *Radiother Oncol.* 2015;114:11-16.