

Technique, protocols and adverse reactions for contrast-enhanced spectral mammography (CESM): a systematic review

Moreno Zanardo, Andrea Cozzi, Rubina Manuela Trimboli, Olgerta Labaj, Caterina Beatrice Monti, Simone Schiaffino, Luca Alessandro Carbonaro and Francesco Sardanelli
 Zanardo et al. *Insights into Imaging* (2019) 10:76 <https://doi.org/10.1186/s13244-019-0756-0>

Abstract¹

We reviewed technical parameters, acquisition protocols and adverse reactions (ARs) for contrast-enhanced spectral mammography (CESM). A systematic search in databases, including MEDLINE/EMBASE, was performed to extract publication year, country of origin, study design; patients; mammography unit/vendor, radiation dose, low-/highenergy tube voltage; contrast molecule, concentration and dose; injection modality, ARs and acquisition delay; order of views; examination time. Of 120 retrieved articles, 84 were included from 22 countries (September 2003–January 2019), totalling 14012 patients. Design was prospective in 44/84 studies (52%); in 70/84 articles (83%), a General Electric unit with factory-set kVp was used. Per-view average glandular dose, reported in 12/84 studies (14%), ranged 0.43–2.65 mGy. Contrast type/concentration was reported in 79/84 studies (94%), with Iohexol 350 mgI/mL mostly used (25/79, 32%), dose and flow rate in 72/84 (86%), with 1.5 mL/kg dose at 3 mL/s in 62/72 studies (86%). Injection was described in 69/84 articles (82%), automated in 59/69 (85%), manual in 10/69 (15%) and flush in 35/84 (42%), with 10–30 mL dose in 19/35 (54%). An examination time < 10 min was reported in 65/84 studies (77%), 120 s acquisition delay in 65/84 (77%) and order of views in 42/84 (50%) studies, beginning with the craniocaudal view of the non-suspected breast in 7/42 (17%). Thirty ARs were reported by 14/84 (17%) studies (26 mild, 3 moderate, 1 severe non-fatal) with a pooled rate of 0.82% (fixed-effect model). Only half of CESM studies were prospective; factory-set kVp, contrast 1.5 mL/kg at 3 mL/s and 120 s acquisition delay were mostly used; only 1 severe AR was reported. CESM protocol standardisation is advisable.

Conclusion regarding Power Injectors

Contrast mammography can be performed with either a power injector (highly recommended) or manual technique. Use of power injectors are known to be more effective in obtaining a stable contrast inflow and bolus shape. Moreover, the use of a power injector allows for the administration of a bolus chaser, a technical refinement that has shown good results in CT.² Combined, these suggest physicians and patients both will likely benefit from the use of a power injector, and thus have a better overall experience.

¹ Technique, protocols and adverse reactions for contrast-enhanced spectral mammography (CESM): a systematic review

² Technique, protocols and adverse reactions for contrast-enhanced spectral mammography (CESM): a systematic review

For more information regarding CEDM, visit www.hologic.com