outcome in patients with mantle cell lymphoma after combined immunochemotherapy: a European MCL intergroup study. Blood. 2009 Dec 23. [Epub ahead of print].
[7] Schulz H, Bohlius JF, Trelle S, Skoetz N, Reiser M, Kober T, Schwarzer G, Herold M, Dreyling M, Hallek M, Engert A:Immunochemotherapy with Rituximab and overall survival in patients with indolent or mantle cell lymphoma: a systematic review and meta-analysis. J Natl Cancer Inst. 2007 May 2;99:706–14.
[8] Rummel MJ, Niederle N, Maschmeyer G, et al: Bendamustin plus rituximab is superior in respect of progression free survival and CR rate when compared to CHOP plus rituximab as first-line treatment of patients with advanced follicular, indolent, and mantle cell lymphomas: Final results of a randomized phase III study of the StiL ASH 2009, #405.
[9] Dreyling, G. Lenz, E. Hoster, et al: Early Consolidation by Myeloablative Radiochemotherapy followed by Autologous Stem Cell Transplantation in First Remission significantly prolongs Progression-Free Survival in Mantle Cell Lymphoma – Results of a Prospective Randomized Trial of the European MCL Network. Blood 105: 2677–2684, 2005.
[10] Geisler CH, Kolstad A, Laurell A, et al: Long-term progression-free survival of mantle cell lymphoma after intensive front-line immunochemotherapy with in vivo-purged stem cell rescue: a nonrandomized phase 2 multicenter study by the Nordic Lymphoma Group. Blood 2008; 112: 2687–2693.
[11] Goy A, Bernstein SH, Kahl BS, et al: Bortezomib in patients with relapsed or refractory mantle cell lymphoma: updated time-to-event analyses of the multicenter phase 2 Pinnacle study. Annals of Oncology 2009; 20: 520–525.
[12] Habermann TM, Lossos IS, Justice G, et al. Lenalidomide oral monotherapy produces a high response rate in patients with relapsed or refractory mantle cell lymphoma. Br J Haematol 2009; 145: 344–349.
[13] Hess G, Herbrecht R, Romaguera J, et al: Phase III study to evaluate Temsirolimus compared with investigator's choice therapy for the treatment of relapsed or refractory mantle cell lymphoma. JCO 2009; 27: 3822–3829.
[14] Wang M, Oki Y, Pro B, et al: Phase II study of yttrium-90 (90Y)-Ibritumomab Tiuxetan in patients with relapsed or refractory mantle cell lymphoma. JCO 2009; 27: 5213–5218.

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Autologous transplantation in lymphoma: Has rituximab changed the scenario?

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More than 20 years ago the use of autologous hematopoietic stem cell transplantation was shown to be able to cure patients with recurrent aggressive B-cell lymphomas. Patients were more likely to be cured if they had relapsed from a chemotherapy induced complete remission and continued to respond, at least partially, to further chemotherapy regimens. The use of autologous transplantation as part of the primary therapy for patients with poor risk characteristics has remained controversial despite multiple clinical trials. More recently, autologous transplantation has been shown to yield durable responses in ~40% of patients with follicular lymphoma in second remission and has been reported to improve the treatment outcome in patients with mantle cell lymphoma when included in the initial treatment regimen. When rituximab was first introduced into the transplant process, it was reported to yield a higher relapse-free survival when given before transplant and seemed to provide a method of "in vivo" purging when given before stem cell collection. The anticipated side effects of infusion reaction and rare cardiac and pulmonary toxicities are seen when the drug is incorporated into the transplant process. There has also been an unusual late neutropenia seen in patients who receive rituximab before or after autologous transplantation. However, the most important recent finding was somewhat unexpected. Rituximab improves the cure rate of patients with diffuse large B-cell lymphoma by approximately 15%. Thus, fewer patients will be eligible for salvage transplants. When salvage transplants are performed on patients who were initially treated with a rituximab containing combination chemotherapy regimen, the event-free survival seems lower than in patients who never received rituximab. For example, in a Spanish study the three-year progression-free survival dropped from 57% to 17% when comparing patients who never received rituximab with those who had initial treatment including rituximab. The CORAL study found a three-year event-free survival decrease of 47% to 21%. This might be related to rituximab resistance related to previous exposure, or a more resistant group of patients being transplanted after failing an initial rituximab containing regimen. However, it still may be that auto transplant is the superior therapy for patients with relapsed, chemotherapy sensitivity aggressive lymphoma. The "overall" cure rate for these patients may not have changed, but fewer will be salvaged with transplantation.

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Fluorodeoxyglucose (FDG) positron emission tomography (PET) in Lymphoma

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Fluorodeoxyglucose positron emission tomography (FDG-PET) is being increasingly incorporated into the management of lymphoma, due to its unique ability to reflect the metabolic activity of malignant cells in vivo.
FDG-PET has proved to have a higher sensitivity than CT in the staging of Hodgkin Lymphoma (HL) and Diffuse Large B-cell Lymphoma (DLBCL), identifying both nodal and extranodal sites of disease not detected by conventional imaging. It has further been shown to discriminate between 'active' lymphoma and scar tissue following therapy leading to a re-definition of the response criteria, eliminating the category of 'CRu' [1,2].
There is an increasing body of evidence suggesting that it may be possible to individualise therapy on the basis of functional imaging after the first two cycles of treatment [3,4]; randomised clinical trials are testing this hypothesis.
During the course of the next decade the full potential of PET scanning will become apparent. Meanwhile it remains to be established which method of interpreting the result is optimal and whether its use extends beyond HL and DLBCL.

Reference(s)

[1] Juweid, M.E., et al., Use of positron emission tomography for response assessment of lymphoma: consensus of the Imaging Subcommittee of International Harmonization Project in Lymphoma. J Clin Oncol, 2007. **25**(5): p. 571–8.
[2] Cheson, B.D., et al., Revised response criteria for malignant lymphoma. J Clin Oncol, 2007. **25**(5): p. 579–86.
[3] Haioun, C., et al., [18F]fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET) in aggressive lymphoma: an early prognostic tool for predicting patient outcome. Blood, 2005. **106**(4): p. 1376–81.
[4] Hutchings, M., et al., FDG-PET after two cycles of chemotherapy predicts treatment failure and progression-free survival in Hodgkin lymphoma. Blood, 2006. **107**(1): p. 52–9.