Peripheral T-cell lymphomas (PTCLs) are a rare and heterogeneous group of T-cell malignancies characterized by a very poor outcome. The optimal treatment for PTCLs remains controversial. The role of stem cell transplantation in PTCLs has been investigated; however, no randomized control studies specifically dedicated to PTCLs are currently available. Several retrospective and prospective studies have suggested that high-dose chemotherapy (HDT) followed by autologous stem cell transplantation (ASCT) may improve the survival in patients with chemosensitive T-cell lymphoma, either upfront or as salvage treatment. This review provides a summary of the current literature with the intent to explore the role of ASCT in various clinical scenarios.

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Peripheral T-cell lymphomas (PTCLs) are a heterogeneous group of aggressive non-Hodgkin lymphomas (NHLs) representing approximately 10%–15% of lymphoid neoplasms in Western countries. Clinical appearance and manifestation sites vary widely among the different subgroups of PTCLs, and the classification by morphology only appears to be extremely difficult. The integration of morphologic, immunophenotypic, genetic, and clinical features let to identify four subgroups: cutaneous T-cell lymphomas, primary nodal PTCLs, extranodal lymphomas, and leukemic forms. This review will deal with the nodal and extranodal forms. Nodal PTCLs represent the most common and heterogeneous subtype of PTCL, including angioimmunoblastic T-cell lymphoma (AITL, 18%), anaplastic lymphoma kinase-positive (ALK\(^+\), 7%) and anaplastic lymphoma kinase-negative (ALK\(^-\), 5%), anaplastic large cell lymphoma (ALCL), adult T-cell lymphoma (ATCL, 10%), and not otherwise specified (NOS, 26%). The extranodal form includes the rare but well-characterized form of T-cell lymphoma known as extranodal natural killer (NK)/T-cell lymphoma, nasal type (nasal NKTCL), as well as enteropathy type intestinal T-cell lymphoma (ENTL), and hepatosplenic T-cell lymphoma (HSL). The epidemiology of PTCLs shows important geographic variations, with overall higher incidence in Asia and Central/South America than Western countries. The majority of patients are diagnosed in advance stage, with widespread disease. The median age at diagnosis is 60 years, with approximately 40% of cases occurring between the ages of 55 and 74, and only about 5% occurring after the age of 85. However, several subtypes had a median age that is much younger, including ALCL, ALK\(^+\) (33 years); hepatosplenic type (34 years); and subcutaneous panniculitis-like PTCL (35 years). It has been long recognized that the majority of PTCLs have a very poor prognosis compared to their B-cell counterpart. Treatment outcomes for PTCLs are substantially inferior to B-cell lymphoma. T-cell phenotype per se is an independent negative prognostic factor. The International T-Cell Lymphoma Study reported an overall survival (OS) and failure-free survival (FFS) of only 10%–15 years. Several prognostic scores have been evaluated to divide patients into low risk or high risk. The International Prognostic Index (IPI) appears to be prognostic for patients with PTCLs. Other prognostic models have been developed specifically for patients with PTCLs. The Prognostic Index for PTCLs (PIT score), based on age, lactate dehydrogenase (LDH), performance status, and bone marrow involvement, stratifies patients into more distinct prognostic groups compared to the IPI. Regarding the impact of histologic subtypes, the most important prognostic factor is the presence or absence of ALK in ALCL. The OS of ALK\(^+\) ALCL is substantially better than that seen for ALK\(^-\) ALCL (70% \(v\) 49%, respectively). However, within the good prognostic category of ALK\(^+\) ALCL, survival was 90% for the low/low intermediate risk group and 33% for the high/high intermediate risk group. In multivariate analysis ALK expression and IPI were able to predict survival among ALCL patients. Currently, ALK positivity identifies the only histologic subtype with good prognosis.
Historically, the treatment of PTCL has been largely derived from that applied for B-NHL. Anthracycline-containing chemotherapy regimens were able to induce complete remission (CR) in 54% of the patients with T-cell lymphomas, with an OS of 41%. Comparative analysis with B-NHL showed no difference in response rate; however, T-cell lymphomas relapsed more frequently and earlier than B-cell lymphomas. When the main subgroups of T-cell lymphoma were analyzed, only ALK⁺ ALCL had an equivalent or even superior prognosis compared to aggressive B-NHL.

A retrospective analysis on more than 1,300 newly diagnosed or relapsed/refractory PTCLs, evaluated in the International T-Cell Lymphoma Project, reported that the majority of patients with PTCLs did not clearly benefit from an anthracycline-containing regimen over a non-anthracycline-containing regimen. Moreover, from this study it emerged that about 30% of PTCLs are primary refractory and the survival curve does not reach a plateau, with a long-term survival rate of only 10%–30%. Neither intensified/escalated chemotherapeutic approaches nor the addition of a monoclonal antibody such as alemtuzumab has demonstrated a clear advantage in sustained remission and prolonged survival. In 2010 for the first time the incorporation of etoposide into the CHOP (cyclophosphamide, doxorubicin, vincristine, prednisone) treatment (CHOEP) was shown to improve event-free survival (EFS), at least in a subset of younger patients with PTCLs, without significant increasing the percentage of adverse events, suggesting a novel strategy to investigate further.

The discouraging results achieved with conventional therapies let to the investigation of new concepts, including high-dose chemotherapy (HD) followed by autologous stem cell transplantation (ASCT) or allogeneic stem cell transplantation (allo-SCT). So far, no randomized control trials exclusively dedicated to SCT in PTCL have been published; the majority of data derive from retrospective studies or phase II studies, often including both first-line and relapsed patients, therefore making it extremely difficult to obtain a conclusive analysis.

Here, we review and comment on the role of ASCT in PTCLs based on the prospective and retrospective data currently available.

**FRONTLINE AUTOLOGOUS STEM CELL TRANSPLANTATION**

Randomized trials on frontline ASCT are lacking, mainly because of the rarity of these diseases; therefore, no data are currently available to conclusively support the role of frontline ASCT. However, several phase II prospective trials have suggested the benefit of upfront ASCT, in particular for patients achieving at least a partial response (PR) after induction therapy (Table 1).

In 2006, the long-term results of two Italian prospective phase II studies on sequential HDT, followed by ASCT, were reported. In an-intent-to-treat (ITT) analysis, only 46 of 62 patients (74%) completed the whole program. Progressive disease during the induction phase was the main obstacle for proceeding to the autografting.

### Table 1. Prospective Studies of Frontline ASCT in PTCL-Exclusive Patients

<table>
<thead>
<tr>
<th>Authors</th>
<th>PTCLs</th>
<th>Status at Transplant</th>
<th>Transplant Rate</th>
<th>TRM</th>
<th>Response Rate</th>
<th>PFS</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>D’Amore et al¹⁷</td>
<td>166</td>
<td>ORR 82%</td>
<td>72%</td>
<td>1.2%</td>
<td>CR/u CR 78%</td>
<td>44% (5 yr)</td>
<td>51% (5 yr)</td>
</tr>
<tr>
<td>Reimer et al¹⁶</td>
<td>83</td>
<td>PD 16%</td>
<td>CR1 47%</td>
<td>66%</td>
<td>PR 8%</td>
<td>CR 58%</td>
<td>36% (3 yr)</td>
</tr>
<tr>
<td>Corradini et al¹³</td>
<td>62 (19 ALK⁺)</td>
<td>PR1 24%</td>
<td>CR1 56%</td>
<td>71%</td>
<td>PR 8%</td>
<td>CR 89%</td>
<td>30% (12 yr)</td>
</tr>
<tr>
<td>Mercadal et al¹⁵</td>
<td>41</td>
<td>PR1 16%</td>
<td>PD 24%</td>
<td>41%</td>
<td>PR11%</td>
<td>CR 51%</td>
<td>30% (4 yr)</td>
</tr>
<tr>
<td>Rodriguez et al¹⁴</td>
<td>26</td>
<td>PR1 10%</td>
<td>CR 46%</td>
<td>73%</td>
<td>0%</td>
<td>PR 7%</td>
<td>53% (3 yr)</td>
</tr>
</tbody>
</table>

Abbreviations: ASCT, autologous stem cell transplantation; PTCL, peripheral T-cell lymphoma; TRM, transplant-related mortality; PFS, progression-free survival; OS, overall survival; ALK, alkaline kinase; ORR, overall response rate; CR, complete response; PR, partial response; PD, disease progression; uCR, unconfirmed CR; ND, not determined.
### Table 2. Retrospective Studies on ASCT as Salvage Strategy in PTCL Patients

<table>
<thead>
<tr>
<th>First Author</th>
<th>No. of Patients</th>
<th>Histology</th>
<th>Status at Transplant</th>
<th>Follow-up (mo)</th>
<th>PFS</th>
<th>OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodriguez32</td>
<td>29</td>
<td>No data</td>
<td>CR 38%, PR 48%</td>
<td>3 (1–4)</td>
<td>CR 79%</td>
<td>32% (3 yr) 39% (3 yr)</td>
</tr>
<tr>
<td>Song25</td>
<td>36</td>
<td>PTCL 56%, ALCL 25%</td>
<td>CR 42%, PR 50%</td>
<td>2 (1–3)</td>
<td>No data</td>
<td>42</td>
</tr>
<tr>
<td>Blystad33</td>
<td>40</td>
<td>PTCL 50%, ALCL 35%</td>
<td>CR1 27%, PR1 15% CR2/CRCR3 43%, PR2 15%</td>
<td>No data</td>
<td>CR 80%</td>
<td>36</td>
</tr>
<tr>
<td>Rodriguez19</td>
<td>115</td>
<td>PTCL 63%, ALCL 22%, NK/T 15%</td>
<td>CR1 32%, CR2/CRCR3 24%, PR 38% Ref. 5%</td>
<td>No data</td>
<td>CR 86%</td>
<td>37</td>
</tr>
<tr>
<td>Jantunen30</td>
<td>37</td>
<td>PTCL 38%, ALCL 38%, EATL 14%</td>
<td>CR/PR1 49%, CR/PR2 38%, Other 13%</td>
<td>2 (1-4)</td>
<td>CR 76%</td>
<td>24</td>
</tr>
<tr>
<td>Jagasia34</td>
<td>28</td>
<td>ALCL 54%, PTCL 21%, AITL 11%, NK/T 11%</td>
<td>CR1 3%, CR2 36%, PR1/PR2 50%, PD 11%</td>
<td>No data</td>
<td>PR 5%</td>
<td>CR/PR1 64%, Other 28% 50% (3 yr) CR/PR1 63%, Other 45% 69% (3 yr)</td>
</tr>
<tr>
<td>Kewalramani26</td>
<td>24</td>
<td>PTCL 58%, ALCL ALK - 17%, AITL 17%</td>
<td>CR 62%, PR 38%</td>
<td>No data</td>
<td>No data</td>
<td>72</td>
</tr>
<tr>
<td>Kim31</td>
<td>40</td>
<td>PTCL 50%, NK/T 25%, ALCL 13%</td>
<td>CR 28%, PR 63%, PD10%</td>
<td>2 (1-4);</td>
<td>CR 60%</td>
<td>16</td>
</tr>
<tr>
<td>Rodriguez20</td>
<td>123</td>
<td>PTCL 57%, ALCL 25%, AITL 8%</td>
<td>PR1 36%, CR ≥2 36%, PR ≥2 16%, PD 9%</td>
<td>2(1-4)</td>
<td>PR 10% PD 20% CR 37%</td>
<td>61</td>
</tr>
<tr>
<td>Smith35</td>
<td>32</td>
<td>PTCL 34%, ALCL 66%</td>
<td>CR1/PR1 19%, Ref. 26%, Relapse 55%</td>
<td>2(1-4)</td>
<td>PR 11% PD 16%</td>
<td>No data</td>
</tr>
<tr>
<td>Chen24</td>
<td>53</td>
<td>PTCL 30%, ALCL 34%, AITL 17%</td>
<td>CR1/PR1 28%, CR2/PR2 49%, PD 19%</td>
<td>No data</td>
<td>CR 80%</td>
<td>60</td>
</tr>
<tr>
<td>First Author</td>
<td>No. of Patients</td>
<td>Histology</td>
<td>Status at Transplant</td>
<td>Median Prior Lines</td>
<td>Response Rate</td>
<td>Follow-up (mo)</td>
</tr>
<tr>
<td>--------------</td>
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<td>----------------------</td>
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</tr>
<tr>
<td>Yang</td>
<td>21</td>
<td>PTCL 100%</td>
<td>CR1/PR 5/19%, CR2/PR 5/39%, PD 9.4%</td>
<td>No data</td>
<td>No data</td>
<td>30</td>
</tr>
<tr>
<td>Numata</td>
<td>22</td>
<td>PTCL 19%, ALCL 14%, AITL 17%, NK 11%</td>
<td>No data</td>
<td>No data</td>
<td>CR 59%</td>
<td>78</td>
</tr>
<tr>
<td>Nademane-</td>
<td>36</td>
<td>PTCL 45%, ALCL 45%, AITL 10%</td>
<td>CR1/PR 12%, CR2 31%, PD 30%, Relapsed 21%</td>
<td>No data</td>
<td>No data</td>
<td>66</td>
</tr>
<tr>
<td>Abbreviations: ASCT, autologous stem cell transplantation; PTCL, peripheral T-cell lymphoma; PFS, progression-free survival; OS, overall survival; ALCL, anaplastic large cell lymphoma; NK, natural killer cell; ALK, alkaline kinase; AITL, angioimmunoblastic T-cell lymphoma; ORR, overall response rate; CR, complete response; PR, partial response; PD, disease progression; uCR, unconfirmed CR; sens./ref., sensitive/refractory.</td>
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</tbody>
</table>
phase and the main cause of treatment failure. The high progression rate led to disappointing 12-year OS and disease-free survival (DFS) curves (34% and 55%, respectively). However, in multivariate analysis, achieving CR prior to transplant was strongly correlated with a superior 10-year EFS compared to less than CR; the 12-years DFS of this specific subgroup was projected at 60%, suggesting that consolidation of CR with ASCT can offer a greater chance of long-term survival. A separate analysis on ALK+ ALCL patients showed the most favorable OS and EFS for this specific histology subtype (62% and 54%, respectively, compared to 21% and 18% for non-ALK+), with a further survival advantage for low-risk age-adjusted IPI (aIPI) compared to intermediate–high risk categories.

In 2007, the GELTAMO experience was reported by Rodriguez, et al.14 Twenty-six patients with nodal PTCL, excluding ALK+ ALCL, received three courses of Mega-CHOP. Gallium scan–negative patients received one more course of treatment followed by ASCT, those remaining gallium scan–positive received two courses of salvage therapy (ifosfamide/etoposide treatment) and, patients with chemosensitive disease proceeded to ASCT. Overall, 73% of patients received ASCT and 89% were in CR after transplant. After a median follow-up of 3 years, OS and progression-free survival (PFS) of the entire cohort were 73% and 53%, respectively. In the subgroup of patients receiving transplant, 2-year OS and PFS were 84% and 56%, respectively. In univariate analysis, chemosensitive status after the first three cycles of treatment or at the time of transplant was the only prognostic factor for OS. Interestingly, to rescue primary resistant or early progressive patients, the investigators highlighted the role of alternative salvage treatment strategy before ASCT.

In 2008 Mercadal, et al,15 on behalf of GELCAB, reported the data on 41 PTCL patients, excluding ALK+ ALCL and cutaneous forms, treated with intensive chemotherapy (three courses of high-dose CHOP alternating with three courses of ESHAP [etoposide, methylprednisolone, cytarabine, cisplatin]) followed by ASCT as consolidation. Only 59% of patients achieved a CR or PR, and an even lower proportion of patients (41%) eventually received ASCT. The investigators highlighted the high rate of severe hematologic toxicity and mobilization failure. After a median follow-up of 3.2 years, 4-year OS and PFS were 39% and 30%, respectively. No difference in term of OS was observed in CR patients who were candidates for ASCT according to whether ASCT was carried out or not.

The impact of CHOP regimen before upfront ASCT was prospectively evaluated by Reimer, et al.16 From 2000 to 2006, 83 PTCLs (excluding ALK+ ALCL) patients were treated with four to six cycles of CHOP followed by stem cell collection preceded by a mobilizing cycle (DexaBEAM [dexamethasone BCNU, etoposide, cytarabine, melphalan] or ESHAP). Patients in CR or PR underwent myeloablative chemo-radiotherapy (fractionated total-body irradiation and high-dose cyclophosphamide) followed by ASCT. In this study, 66% of patients received ASCT, while the remaining did not complete the study due to early progressive disease. In the ITT analysis, the overall response rate (ORR) after transplant was 66% (56% CR and 8% PR). The estimated 3-year OS and PFS for patients in CR were 48% and 36%, respectively. The 3-year OS and PFS for the entire population undergoing ASCT was 71%, whereas it was only 11% for those who did not undergo transplant. A trend for longer OS was observed in patients with low/intermediate low IPI (v high/intermediate high) who underwent transplantation in CR (v PR). The results of the study suggested that upfront ASCT is an effective treatment in PTCL; however, pretransplantation treatments need to be improved to increase both the response and transplantation rate.

Based on the encouraging result reported by the German study on CHOEP treatment,12 the Nordic group designed a phase II study17 to evaluate the impact of a dose-intensified induction schedule (CHOEP-14 for six cycles) consolidated in first PR/CR with high-dose therapy (BEAM/ASCT). After induction, 82% of patients were in CR or PR. Disease refractory to induction treatment was observed in 16% of patients. Among the 70% of patients receiving ASCT, 78% were in CR after ASCT, 8% were in PR, and 7% experienced early disease progression. With a median follow-up of 60.5 months, 5-year OS and PFS were 51% and 44%, respectively. With respect to prognostic parameters, a significant correlation was observed between IPI (low/intermediate low v high/intermediate high) and OS. In multivariate analysis, ALK ALCL showed a significantly better outcome as compared with other subtypes. The problem of the assessment of diagnosis by an expert pathologist was again raised in this study by the results of centralized review that modified 13% of original diagnoses.

From the studies reported above, several important points emerge: (1) approximately one third of patients display primary resistant or early progressive disease becoming, therefore, not transplant eligible; (2) nevertheless, among the patients who are able to receive ASCT, the outcome seems to be superior to conventional chemotherapy; and (3) a treatment strategy including ASCT frontline can lead to long-term response in chemosensitive patients. The challenge is to make more patients able to receive the transplant and this group will be expanded by the use of new drugs such as pralatrexate and romidepsine.

**AUTOLOGOUS STEM CELL TRANSPLANTATION IN RELAPSE/REFRACTORY PTCLs**

In 1995, the PARMA study18 demonstrated that HDT followed by ASCT is the treatment of choice for patients with relapsed aggressive B-NHL, resulting in 40%–50% long-term DFS; on the contrary, the role of ASCT in T-cell NHL is less clear and still to be defined. Several retrospective studies have been published on the use of ASCT as salvage treatment (Table 2). It is important to consider that the majority of these retrospective studies are heterogeneous.
in terms of histological subgroups, patient characteristics, prognostic factors, myeloablative regimens, and duration of follow-up. In addition, most of them contain some type of bias, largely due to patient selection and inclusion of the patients receiving either upfront or salvage ASCT.

The two largest retrospective studies on ASCT in PTCL were reported by the GELTAMO group. In 2003, a series of 115 PTCL patients, including ALCL (22%) and NK/T (15%) subtypes, treated from 1990 to 1999 was reported. At the time of transplant 32% of patients were in first CR and 24% in second or more CR. With a median follow-up of 37 months, the 5-years OS and DFS were 56% and 60%, respectively. The 5-years OS rates, according to disease status at transplantation, were 80%, 50%, and 46% for patients in CR1, CR2/CR3, and PR, respectively. In multivariate analysis, only LDH level before transplantation predicted survival. Patients transplanted in first CR or with low aaIPI had a significantly longer DFS. In 2007, the GELTAMO study reported a larger series of 123 patients who received ASCT as salvage treatment from 1990–2004. The 5-year OS and PFS were 45% and 34%, respectively. From multivariate analysis, three factors emerged as independent factors for outcome: having an aaIPI > 1, a high β₂-microglobulin level, or more than one extranodal disease site. Patients with no pretransplant adverse factors had an OS and PFS at 5 years of 60% and 43%, respectively. Moreover, PFS and OS of patients in second or subsequent CR at transplant (35% and 57%, respectively) were superior compared to those in second PR (23% and 33%) or with refractory disease (10% and 9%). As in other retrospective studies,21,22 the importance of being in CR at the time of transplant to achieve a long-term survival was emphasized.

Several studies have specifically described the outcome of ASCT in patients with chemosensitive disease. In 2001 Blystad, et al23 reported a double-institution Scandinavian study on 40 patients with chemosensitive disease who underwent ASCT, either frontline (CR1 27%, PR1 155) or as salvage treatment (CR2/CR3 43%, PR2 15%) from 1990 over a period of 10 years. With a median follow-up of 36 months, 3-years PFS and OS rates were 48% and 58%, respectively. Interestingly, purging of the autograft was performed in 13 of the 40 patients; however, no conclusive data on its effect on outcome can be acquired. With a follow-up of 60 months, Chen, et al24 reported the experience of the Stanford University on 53 PTCL patients with chemosensitive disease treated with ASCT from 1989–2006. The 5-year OS was 76% for patients receiving consolidative ASCT in first CR, compared to 48% for patients in second remission or beyond. In multivariate analysis, CR status at +90 days after ASCT was predictive of longer OS and PFS. In this study, no benefit was observed with T-cell–purged graft.

Also, the Japan registry25 demonstrated better long-term outcome in PTCL patients transplanted in first CR or PR compared to other disease status (5-year OS 72.9% v 45.8%, PFS 73.1% v 42.2%). From the database of the Cleveland Clinic, Smith, et al26 evaluated 32 patients with relapsed disease uniformly treated with the same preparative regimens (busulfan/etoposide/cyclophosphamide). Their 5-year OS and relapse-free survival (RFS) rates were 34% and 18%, respectively, lower than what has been published in other studies. Several publications have retrospectively compared the outcome of aggressive T- and B-cell lymphoma with chemosensitive relapsed treated with ASCT. Song, et al27 reviewed 36 patients with relapsed or refractory PTCLs undergoing ASCT and matched them to patients with aggressive B-NHL treated at the same institution. Patients were similar for age, stage at relapse, presence of extranodal disease, and chemosensitivity to salvage treatment. The 3-year EFS rates of patients with the PTCLs, ALCL, and diffuse large B-cell lymphoma (DLBCL) were 37%, 67%, and 48%, respectively. The 3-year OS rates of patients with the PTCLs, ALCL, and DLBCL were 37%, 67%, and 48%, respectively. This study showed inferior outcomes following ASCT in patients with PTCL NOS compared to ALCL and DLBCL. In 2006 Kewalramani, et al28 evaluated 24 patients undergoing ASCT with relapsed or refractory PTCL (ALK+ ALCL or not documented ALK expression were excluded) who responded to first-line or second-line chemotherapy and compared them with 86 consecutive patients with chemosensitive relapsed or primary refractory DLBCL (before the rituximab era). Five-year PFS rates for PTCL and DLBCL were 24% and 34%, respectively (P = .14); the corresponding OS rates were 33% and 39%, respectively. No significant differences were found between the two groups with respect to time to disease progression and survival after progression, but rituximab was not yet available.

Most of the published data includes heterogeneous subtypes of T-cell NHL; however, more recently some efforts have been made to define the role of ASCT in specific subtypes. Federico, et al29 retrospectively analyzed 243 AITL patients on behalf of the International Peripheral T-Cell Lymphoma Project. Only 17% of patients were treated with ASCT. Five-year OS was 32% in the whole population, confirming the poor outcome of AITL. However, no data were specifically reported on the outcome of patients receiving ASCT. A retrospective analysis of the European Bone Marrow Transplant registry (EBMT)28 on 146 AITL patients demonstrated an OS and PFS of 59% and 42% at 4 years. The PFS was higher in patients who received ASCT in CR, achieving 56% at 4 years versus 23% in the case of chemorefractory disease.

Also, extranodal T-cell lymphoma can benefit from ASCT. In a prospective observational study, EATL treated frontline with alternating courses of IVE (ifosfamide, vincristine, etoposide) and methotrexate followed by ASCT showed a 5-year OS of 60% compared to a historical control of 22% with conventional chemotherapy,30 which supports the role of intense upfront regimens as a bridge to transplant. The retrospective study from the EBMT28 on 44 patients with EATL treated with ASCT showed 4-year PFS and OS of 54% and 59%, respectively, confirming the possibility of long-term disease control.
Taken together, these data show that the ASCT as a salvage strategy appears feasible and safe with a low morbidity and mortality. Disease status at the time of transplantation is critical. A better long-term survival in patients transplanted in CR is described, compared to patients with other disease status. However, since all data in this setting are generated retrospectively, the value of this observation needs further confirmation.

CONCLUSIONS

Across all retrospective and prospective trials that have addressed the role of ASCT in PTCLs, the procedure was considered safe and feasible, but unfortunately resulted in an unavoidable poor outcome in chemorefractory disease.

The role of frontline ASCT remains to be fully delineated. We currently do not know if achieving CR versus PR before transplant, or normalized functional imaging, significantly improves long-term outcome. In general, patients in CR at transplantation had a better long-term outcome compared with patients achieving less than CR or less than PR. In conclusion, all of the prospective trials of upfront ASCT demonstrated that chemosensitive disease is the strongest predictor of outcome; thus, the emerging key message is that only chemosensitive disease seems to benefit from autografting and that there is no reason to perform ASCT in refractory patients. In addition, due to the absence of a phase III trial, we do not know for sure if patients in CR really need consolidation with ASCT. It seems that this is the case if we compare the results of conventional chemotherapy with ASCT, but this is just speculation.

Early progressive disease (PD) after induction treatment, which entails about one third of patients, is the major limitation to proceeding with transplant and represents a treatment failure with currently no alternative effective strategies. In this context, the use of novel agents may potentially improve rate and duration of response and clinical trials are therefore essential, either frontline to evaluate if a larger number of patients can retain a chemosensitive disease, or in chemorefractory patients before transplant to induce a possible response in this subgroup.

In conclusion, regarding the role of SCT, a definitive statement is still to be defined. Therefore it is strongly recommended that patients should be entered into clinical trials designed to evaluate novel therapeutic strategies.

Acknowledgement

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REFERENCES


