Purpose: To analyze the effectiveness of radiotherapy in the management of orbital non-Hodgkin’s lymphoma (NHL).

Patients and Methods: 42 patients (median age 64.5 years) were reviewed retrospectively. The median follow-up period was 58 months. 26 patients had stage IE orbital lymphoma (22 indolent, four aggressive NHLs). 16 patients had advanced NHLs in stages II–IV with orbital involvement (eleven indolent, five aggressive NHLs). The median radiation dose was 40 Gy (20–46 Gy) for indolent lymphoma and 44 Gy (20–48 Gy) for aggressive lymphoma. Patients with stage IE were treated with at least 30 Gy.

Results: The 5-year local control rate for patients with stage I was 100%, the 5-year overall survival 91%. Two distant relapses were found, but no lymphoma-related death was detected. The 5-year local control rate for patients in stages II, III, and IV was 80%. Two local failures were detected. The 5-year overall survival for the advanced stages was 47%, nine patients with stages III and IV died due to systemic progression of lymphoma. Acute, radiotherapy-related complications grade 3/4 were not observed. Late effects grade 1/2 were documented in 45%. Six patients, treated with doses of > 36 Gy, developed grade 3 complications (four cataract, two dryness).

Conclusion: Radiotherapy alone yields excellent local control and overall survival rates in orbital lymphoma stage IE. Local irradiation is also well tolerated and effective in advanced NHL stages with orbital infiltration. Doses of > 36 Gy resulted in an increase of late complications.

Key Words: Orbital lymphoma · Radiotherapy · Non-Hodgkin’s lymphoma · Orbit · Eye

Bestrahlung von Orbitalymphomen. Ergebnisse und Nebenwirkungen


Schlüsselwörter: Orbitalymphom · Strahlentherapie · Non-Hodgkin’s lymphom · Orbit · Auge

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Introduction

Primary non-Hodgkin’s lymphomas (NHLs) of the orbit are rare. They represent approximately 1% of all NHLs and 10% of extranodal NHLs [7]. The majority of the orbital lymphoma are indolent NHLs, most of them extranodal marginal B-cell lymphoma of mucosa-associated lymphoid tissue (MALT) [8, 16, 17]. At first diagnosis, patients are mainly > 60 years [14, 18]. Various parts of the orbit like conjunctiva, eyelids, and retrobulbar tissue can be infiltrated. A bilateral eye involvement is described in 10–15% of all cases [9]. This study analyzes the role of radiation therapy in the management of orbital lymphoma. Intraocular NHLs, which are frequently associated with intracerebral NHLs, were excluded from this report because of their distinct spreading pattern of disease.

Patients and Methods

Patient Characteristics

42 patients with a histopathologically proven NHL of the orbit were treated with radiotherapy from 1990 to 2002 (Table 1). The median follow-up period was 58 months (range 1 month to 13 years). 26 patients presented with localized orbital lymphoma in stage IE (22 indolent and four aggressive NHLs). 16 patients had stage II, III or IV NHL with orbital involvement (eleven indolent and five aggressive NHLs). The most common histological subtype (50%) was the extranodal marginal zone B-cell lymphoma of MALT [11]. A synchronous bilateral eye involvement was diagnosed in five patients, all with stage IV disease. The most common symptoms at first presentation were periorbital swelling (48%), exophthalmus (29%) and visual impairment (21%).

Table 1. Patient characteristics.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Age (years)</th>
<th>Sex [n (%)]</th>
<th>Localization [n (%)]</th>
<th>Region [n (%)]</th>
<th>Stage [n (%)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>64.5</td>
<td>Male: 15 (36)</td>
<td>Unilateral: 37 (88)</td>
<td>Conjunctiva: 18 (38)</td>
<td>IE: 26 (62)</td>
</tr>
<tr>
<td>Range</td>
<td>25–92</td>
<td>Female: 27 (64)</td>
<td>Bilateral: 5 (12)</td>
<td>Lacrimal gland: 12 (26)</td>
<td>IIIE: 1 (2)</td>
</tr>
<tr>
<td>Sex</td>
<td>Male: 15 (36)</td>
<td>Local [n (%)]</td>
<td>Retrolubular: 12 (26)</td>
<td>IVE: 12 (29)</td>
<td></td>
</tr>
<tr>
<td>Localization</td>
<td>Unilateral: 37 (88)</td>
<td>Region [n (%)]</td>
<td>Lid: 5 (10)</td>
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<tr>
<td>Region</td>
<td>Conjunctiva: 18 (38)</td>
<td>Stage [n (%)]</td>
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</tr>
<tr>
<td>Stage</td>
<td>IE: 26 (62)</td>
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</table>

Two patients in stage I and one patient in stage II had an incomplete surgical resection prior to radiotherapy. One patient in stage I and one patient in stage II, both with aggressive lymphoma, received a polychemotherapy (CHOP) with minimal response before irradiation. All patients in stages III and IV (n = 13) were treated with sequential chemotherapy prior to or after radiotherapy.

Survival and relapse rates were calculated using the Kaplan-Meier method [15]. Complications were graded according to the RTOG classification for acute effects, and the LENT-SOMA scoring system for late effects [10].

Radiation Therapy Characteristics

Radiation treatment was given five times weekly, using a fraction size of 2 Gy in 30 patients, 1.8 Gy in ten patients, and 1.5 Gy in one patient. One patient in stage IV was treated with 3-Gy daily doses in a palliative intent. The median total dose for indolent lymphoma was 40 Gy (range 20–46 Gy) and 44 Gy for aggressive lymphoma (range 20–48 Gy). Patients with stage IE were irradiated with at least 30 Gy. All patients were treated using a linear accelerator (Siemens KD2, Concord, CA, USA), 24 of them with 6-MV photons, 16 with 6- to 18-MeV electrons, and two with mixed electron and photon beams. An anterior photon field with a hanging block to shield the eye lens was commonly used for innerorbital tumors in the first years of the study period; a three-dimensional conformal technique was mostly performed in the last years (Figure 1). Superficial lymphomas, e.g., in lacrimal gland or eyelid, were treated with an anterior electron field. The eye lens was shielded with a golden contact lens or a hanging block in these patients.

Results

Stage I

Local Control

All of the 26 stage I patients (26 treated eyes) had a complete response after radiation therapy. No local relapse was observed. The 5-year recurrence free survival rate was 100%.

Local control, distant relapse-free survival, and overall survival are shown in Figure 2.

Distant Relapses

Two systemic relapses were observed resulting in an actuarial 5-year freedom from distant relapse rate of 90%.

One distant relapse with mediastinal and retroperitoneal lymph nodes was detected 29 months after radiation therapy of the orbit. A complete response could be achieved by chemotherapy.

The other relapse with progression in bone marrow and retroperitoneal lymph nodes occurred 36 months after orbital treatment. After chemotherapy with initial complete response, the patient relapsed again and received an additional systemic treatment at the time of analysis.