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Original Article

Characteristics, management, and outcome of patients with uveal melanoma treated by Iodine-125 radioactive plaque therapy in a single tertiary cancer center in Jordan

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Abstract

Objective: To evaluate King Hussein Cancer Center experience in using Iodine-125 COMS radioactive plaque for treatment of Uveal Melanoma in Jordan.
Methods: Retrospective case series of eyes with uveal melanoma treated by Iodine-125 COMS radioactive plaque therapy. Data collection required access to medical, radiology, Labs and pathology reports. Main outcomes studied includes: Demographics, tumor features, eye salvage, visual outcome, metastasis, and mortality.
Results: Between September 2008 and March 2015, 28 eyes for 28 patients had intraocular uveal melanoma and treated by Iodine-125 radioactive plaque therapy. The mean age at diagnosis was 48 years and 16(57%) were males. The mean tumor thickness was 8 mm (range: 4–13 mm), and 27(96%) patients had medium or large size tumor. The radioactive plaques used had a median size of 16 mm (range: 12–20 mm). The mean apical dose was 83.5 Gy (range 81–87 Gy), and the median radiation rate was 7.25 (range: 4.5–13). At median follow up of 2 years (range 0.5–7 years), eye salvage rate was 93%. Four (15%) patients had distance metastasis, and 3(11%) were dead. Fifty percent of patient had visual acuity better than 20/200 at the last date of follow up.
Conclusion: Our preliminary results are encouraging and are comparable to another countries worldwide. The use of Iodine-125 COMs plaque therapy at the inspection of implementation of plaque therapy in the developing countries can lead to eye salvage in more than 90% of cases, and reserves functional vision in more than 50% of cases.

Keywords: Choroid, Enucleation, Melanoma, Radioactive plaque therapy

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Introduction

Uveal melanoma is the most common primary intraocular malignancy in adults and accounts for 5% of all melanomas.[1] It is seen more frequently in Caucasians in comparison with Hispanics, Asians and Africans. For the Whites in the United States, uveal melanoma has an incidence of 0.69 and 0.54 per 100,000 person-year for males and females consecutively with a mean age of 60.[1]

Uveal melanoma mostly appears in the choroid (85–91% of cases), and it is localized to the ciliary body or the iris in 9–15% of cases.[2] Iris melanomas are associated with the earliest detection and overall best prognosis[3] while ciliary body melanomas are associated with the worst prognosis.[4] Around

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50% of patients diagnosed with uveal melanoma will develop metastasis, despite treatment, with survival time after metastasis averaging 6–12 months.[5,6]

The Collaborative Ocular Melanoma Study (COMS) concluded that there was no significant difference between brachytherapy and enucleation in terms of prevention of metastasis and mortality for medium sized melanomas,[7,8] therefore, globe and vision-preserving radiation therapy is the primary treatment of choice for most of uveal melanomas nowadays in the developed world.[1]

Prior to introduction of plaque therapy, patients with the diagnosis of Uveal melanoma underwent enucleation as primary form of treatment at the cost of saving life but scarifying globe and loss of vision. While with the introduction of plaque therapy, it has revolutionized the management and resulted in greater cosmetic effect, preservation of globe and saving some vision in selected case and saving life.[8] In Jordan before 2008, all patients with Uveal melanoma underwent enucleation, but after establishing Plaque therapy program at king Hussein cancer center, plaque therapy has been employed at our center since 2008.[9,10] We report our experience with Iodine-125 (I-125) COMS plaque in our patients with uveal melanoma.

Patients and methods

This study was approved by the Institutional Review Board in KHCC. It was a retrospective case series of 28 eyes of 28 consecutive patients from September 2008 to January 2015 who had intraocular uveal melanoma and treated by Iodine-125 (I-125) radioactive plaque. Selection required access to patients' medical charts, pathologic records, radiology reports, and Labs.

Outcome measures included: patient's age at diagnosis, gender, laterality, smoking, presenting symptoms and visual acuity at presentation. Evaluated tumor clinical characteristics included: tumor location, surface features, shape, thickness, largest basal diameter, size, pigmentation, presence of subretinal fluid, vitreous hemorrhage, cataract, neovascular glaucoma, rubeosis, MRI features, TNM staging, presence and site of metastasis, plaque size, apex dose, rate of radiation, distance between tumor's edge and the optic nerve and the fovea, tumor thickness and visual acuity after treatment.

Inclusion and exclusion criteria

The eligibility criteria for inclusion were eyes with clinical diagnosis of intraocular uveal melanoma treated by radioactive plaques. Radioactive plaque was not used for melanomas involving or touching the optic nerve, thicker than 15 mm, associated with total retinal detachment and/or secondary neovascular glaucoma (NVG), with extraocular extensions, and when the patient couldn't offer the cost of the plaque.

Tumor characteristics and definitions

In this study, the tumors were classified according to the Collaborative Ocular Melanoma Study (COMS) classification. The COMS divided uveal melanomas based on size into small, medium and large tumors. Small melanoma; 5–16 mm at the largest basal diameter (LBD) and 1–3 mm in apical height. Medium-sized melanoma; 16 mm or less at the LBD and had an apical height between 3 mm and 10 mm. And uveal melanomas more than 16.0 mm at the LBD and more than 10 mm in height were defined as large tumors. TNM staging was according to the 7th edition of the American Joint Committee on Cancer (AJCC) staging system.[11]

Follow-up of these patients was documented including period, evidence of metastasis and patient status during the period of the follow-up.

Results

Seventy-six eyes were diagnosed with uveal melanoma in King Hussein Cancer Center (KHCC) between September 2008 and January 2015. Thirty patients were excluded from the data analysis because of inadequate data and/or refused treatment and were lost for follow up, and 28 patients were treated by I-125 radioactive plaque.

Demographics and clinical features

28 eyes with uveal melanoma from 28 patients were studied. The mean age at diagnosis was 48 years (median 44 years, range; 21–75 years). There were 16(57%) males and all (100%) patients had single tumor. All of them were treated by I-125 radioactive plaque therapy, but 2 of them were consecutively enucleated. Demographics are in Table 1.

Tumor features

The melanoma was in the choroid in 23(82%) eyes, in the ciliary body in 5(18%) eyes, and no single patient had iris melanoma in this series. According to the 7th edition of the American Joint Committee on Cancer staging system (UICC/AJCC); 8(29%) were T1, 10(36%) were T2, 9(32%) were T3, and 1(3%) were T4. The median initial tumor thickness was 7.0 mm (mean 7, range 3–14 mm), and the median tumor base dimension was 10.5 mm (mean 11, range 7–16 mm). The distance between tumor margin and the fovea was (mean 4.7 mm, range; 0–16 mm), and between tumor margin and the optic disc was (mean 6.5 mm, range; 2–19 mm). Details of tumor features are in Table 2.

Table 1. Demographics and clinical features.

Number		28	%
Age (Years)	Range	21–75	
	Median	44	
	Mean	48	
Gender	M	16	57
	F	12	43
Side	Right	11	39
	Left	17	61
Smoking	Yes	8	29
	No	20	71
Presenting symptom	Impaired vision	20	71
	Accidental	5	18
	Others[a]	3	11
Visual acuity at presentation	≥0.5	14	50
	0.1–0.4	9	32
	<0.1	5	18

[a] Others included: floaters, wondering eyes.

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