

Review

Porocarcinoma; presentation and management, a meta-analysis of 453 cases



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H I G H L I G H T S

- Porocarcinoma is a rare sort of skin cancer developing from sweat glands.
- Because of rarity of the problem, there is controversy regarding both presentation and management.
- The aim of the current meta-analysis is to summarize all data regarding the disease.

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Background: porocarcinoma is a rare sort of skin cancer developing from sweat glands. Its clinical course and management are not well understood.

Objectives: the current meta-analysis is to address the presentation and management of porocarcinoma. **Data sources:** Web of Science, PubMed, MEDLINE on OVID and Google scholar were searched for English-language studies published before December 1, 2016.

Results: The review of literature revealed 453 cases. From which 222 (49%) cases were male and female were 231 (51%). The mean age was 67.57 years. The mean duration of presentation was 5.57 years ranging from 4 days to 60 years of age. The most common site of affection is the head and neck (39.9%) followed by lower extremity (33.9%). Mass and nodule are the most common modes of presentation. Metastasis occurred at presentation in 110 (31%) cases. The most common organ to which porocarcinoma metastasizes is the nearby lymph node (57.7%).

Conclusions: Porocarcinoma is an aggressive skin cancer. Surgery is the main modality of treatment.

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1. Introduction

Porocarcinoma is a rare sort of skin cancer developing from sweat glands, specifically, it is a malignancy of the eccrine sweat glands [1]. Its etiology is not well understood. However, some studies have showed that the tumor developed from a pre-existing eccrine poroma. From others perspective, chronic light exposure, exposure to chemical agents and immunosuppression could be the predisposing factors for de novo eccrine porocarcinoma [2]. Porocarcinoma is a dangerous disease because of high rate of recurrence after resection and metastasis to vital organs [3,4]. Because of rarity of the problem, there is controversy regarding both presentation and management [5,6]. Liyod et al. revealed features like a rapid increase in size, foul odor and fungating fleshy appearance while Kurashige and colleagues who collects 8 cases revealed that all cases of porocarcinoma presented with erosive reddish nodules [6,7].

Controversy regarding treatment is also present [8]. Kurashige and colleagues who present 8 cases of porocarcinoma summarized that surgical resection should be done in all cases, as adjuvant therapy in form of local irradiation, while Fujimura et al. preferred surgical resection of the mass and giving adjuvant therapy only in special situation [7]. The aim of the current meta-analysis is to summarize all data regarding the presentation and management of cases with porocarcinoma which was done in line with PRISMA guide line [9].

2. Methodology

Information sources and Search: Web of Science, PubMed, MEDLINE on OVID and Google scholar were searched for English-language studies published before December 1, 2016. The search key words were porocarcinoma, carcinoma of sweat gland and tumor of sweat gland. The data collection was supplemented by references cited by included articles.

Eligibility criteria: For a study to be included in this meta-analysis, it should address at least one specific aim (clinical course, management, or both) of porocarcinoma (Fig. 1).

Data collection process: Data were taken directly from the articles by 4 authors independently. Investigators have not been contacted to obtain and confirm the data.

Data items: Several data were extracted and pooled from all included articles. Those articles were socio-demographic characteristics of the patients, sample size, presentations, duration of presentation, method of diagnosis, options for managements, recurrence rate and complications.

Summary measures and Synthesis of results: Extracted data were calculated and re-analyzed totally. According to the variables, they are showed as percentage, mean values, and ranges of variation and percentages. The search in the medical literature revealed 104 studies which included 453 patients.

3. Result

The result reveals 453 patients. From which 222 (49%) case were male and female were 231 (51%). The mean age was 67.57 years ranging from 6 months to 97 years of age. The mean duration of presentation was 5.57 years ranging from 4 days to 60 years. The most common sites of affection are the head and neck (39.9%) followed by lower extremity (33.9%). Table 1 shows the distribution of the patients according to the site of affection. Mass and nodule are the most common modes of presentation. Table 2 shows presentation of the porocarcinoma with their frequency of appearance. Metastasis occurred at presentation in 110 (31%) cases. The most common organs to which porocarcinoma metastasize are the nearby lymph nodes (57.7%), followed by lung (12.8%). Table 3 shows the organs of metastasis.

4. Discussion

Based on their findings, some authors stated that porocarcinoma is more common among male patients [7,26]. The current metadata showed that porocarcinoma is evenly distributed according to the gender, both male and female are equally affected, (male 49% is nearly the same female 51%). The mean age of presentation is seventh and eighth decades of life (mean age 67.57 years, ranging from 7 months to 97 years) [34]. Most of the patients present with mass without symptoms (poroma) long time before converting to malignant type (porocarcinoma) [8,62]. According to this study, the mean duration of presentation was 5.73 years. Robson and colleagues reported a case of porocarcinoma presented with history of 60 years of benign stable mass [30]. This finding may suggest that aggressive management of benign subcutaneous mass is advised to prevent malignant conversion especially when the diagnosis is not confirmed to be benign. The literature showed that most of the cases of porocarcinoma present with either nodule or mass [31]. The current meta-data also confirmed this finding and about 71.2% cases presented with either nodule or mass. Yamamoto and associates reported that majority of porocarcinoma lesions appear in the upper extremity (80%) while Shiohara and colleagues revealed the reverse of this finding. In their 12 case series, they reported that in 9 (75%) cases of them, the primary site was the

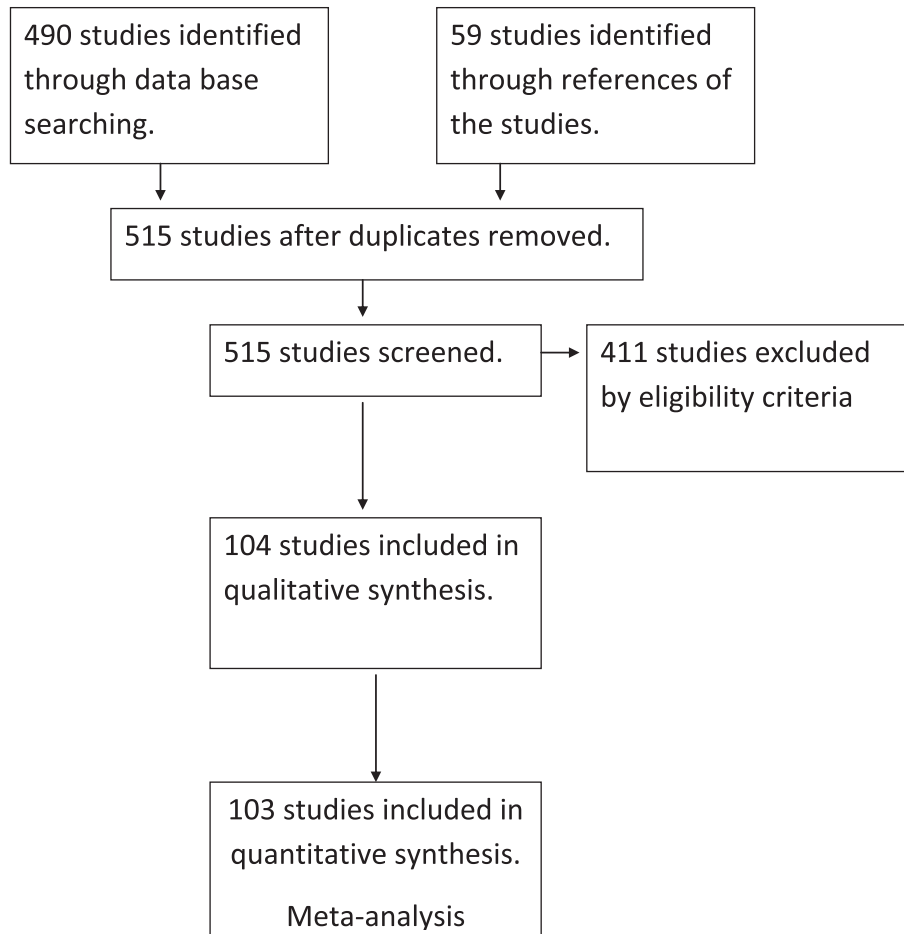


Fig. 1. The process and flow of the literature review.

lower extremity [30,103]. Domere et al. stated that the most common primary sites for porocarcinoma are head and neck [28]. The result of this review confirmed the latter claim and found that in (39.9%) of the patients the primary sites were head and neck,

Table 1
Distribution of the patients according to the site of presentation.

Site	Number (%)	References
Head and neck	140 (39.9)	[3,5,7,8,10–45]
Lower extremity	119 (33.9)	[8,46–62]
Upper extremity	31 (8.8)	[1,8,63–76]
Back	18 (5.1)	[8,77–84]
Chest wall	16 (4.6)	[85–88]
Genitalia	14 (4)	[8,89–95]
Abdomen	9 (2.6)	[8,96–101]
Perianal	2 (0.6)	[102,103]

Table 2
The most common presentations of porocarcinoma.

Presentation	Number/Total	percentage
Mass and nodules	109/153	71.2
Ulcer	28/153	18.3
Plaque	15/153	9.8
swelling	2/153	1.3
Wart	1/153	0.6
papule	1/153	0.6
nevus	1/153	0.6

followed by lower extremity (33.9%). The risk factors for developing porocarcinoma are not well understood. Several authors reported that their patients were in immune-compromised state. Some of them had history of immunosuppressive therapy and others decreased immunity from diseases [21,26,29]. Belin et al. studied two patients with porocarcinoma who received immunosuppressive medications, one for renal transplantation, and another for chronic lymphoid leukemia [26]. Mahomed and associates reported 5 cases of porocarcinoma with history of immune-compromised conditions, three of them were recipients of renal transplant and other two cases were the victims of acquired immune deficiency syndrome (AIDS) [29]. Owing to occurrence most commonly in sun exposed area (head, neck, hand, leg), some authors concluded that exposure to sun light is another risk factor [3,5,7,10,24]. In almost all cases, tissue biopsy was necessary for diagnosis in form of

Table 3
The frequency of the organs to which porocarcinoma mostly metastasize.

Site	Number/total	Percentage
Lymph nodes	90/156	57.7
Lung	20/156	12.8
Liver	14/156	9
Brain	14/156	9
Cutaneous	9/156	5.8
Bone	5/156	3.2
Breast	1/156	0.6
Stomach	1/156	0.6
Disseminated	2/156	1.3

excisional, incisional and punch biopsy [21,29]. In the literature, several histological features and subtype mentioned. These includes; ductal differentiation, nests of basaloid cells, squamoid tumor cells, infiltrative spinal cells, cells of acanthotic epidermis, Borst Judasson appearance, ulcerated epithelial tumor, bowenoid porocarcinoma, nests of small atypical cells, clear-cell, high infiltrative pattern and hyperchromatic nuclear [7,13,26,62,72,102,103]. Surgery was the main mode of therapy with adjuvant chemoradiotherapy if metastasis and/or recurrence occurred [50,82–104]. Metastasis was found in 110 (31%) cases [3,10,63,65,68,73,76,86]. High rate of metastasis showed by this data reflects the real picture or due to the fact that physicians who encountered metastatic porocarcinoma are more likely to report their cases than the ones who did not encounter metastases is not known. The most common organs of metastasis are the regional lymph nodes (57.7%) [10,63,65,73]. Although regional lymph node dissection was not performed routinely, high rate of metastasis to regional lymph nodes revealed by these meta-data may necessitate regional lymph node dissection. In spite of that there are no enough data to support routine lymph node dissection. Although most of the case series and case report did not mention the follow up and survival rate of the patient accurately, it can be seen in some report that porocarcinoma is very aggressive malignancy and kills the patient few months after the diagnosis regardless of the sort of management [67–69,72,95]. There are several limitations for study, first: the condition is rare. Second. The included papers were of different types. Third. Some of the papers did not report necessary data. Fourth. Some papers were so old that cannot be retrieved completely.

In conclusion, porocarcinoma presents with mass and nodule and affect head and neck in most of the cases. Tissue biopsy is the main method of diagnosis. It may develop from the benign counterpart (poroma) which may present several years before. It commonly metastasizes to lymph nodes. Wide local excision and regional lymph node dissection are advised. Chemotherapy and radiotherapy are necessary when presented with metastasis and recurrence.

Ethical approval

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Author contribution

Abdulwahid M. Salih, F.H. Kakamad, Hiwa O. Baba: substantial contribution of the concept and design, drafting the manuscript and final approval of the manuscript.

Rawezh Q.Salih, Hawbash M.R, Shvan H. Mohammed, Snur Othman: substantial contribution of the concept and design, acquisition of the data, final approval.

Yadgar A. Saeed, Imad J. Habibullah, Aso S. Muhiudeen, Rebaz O. Nawroly, Zuhair D. Hammood, Nawshirwan H. Abdulkarim: substantial contribution of the concept and design, analysis of data, drafting the manuscript, final approval of the data.

Conflicts of interest

None.

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Further reading

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