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Characteristics of Radiotherapy Treatment on Penile Squamous Cell Carsinoma

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Abstract

Background: Squamous cell carcinoma (SCC) of penis is rare cancer that originates from epithelial cells in the inner prepuce or glans of the penis. This study aims to investigate how the picture of radiotherapy treatment in penile squamous cell carcinoma at Arifin Achmad Hospital from 2014 to 2019.

Materials and methods: This is a descriptive study using secondary data from medical records and radiotherapy for squamous carcinoma patients at Arifin Achmad Hospital, Riau Province from 2014 to 2019.

Results: The results showed that there were 28 penile squamous cell carcinoma patients where 3 of them were treated with radiotherapy at Arifin Achmad Hospital, Riau Province from 2014 to 2019. The picture of radiotherapy management of penile squamous carcinoma based on the largest age group was the age range of 45-60 years old (100%) with the largest tribe being Batak (66.6%), with enlarged inguinal lymph nodes (100%). Mostly, they were in stage 4 (100%) with total penectomy operative management (100%). Most clinical symptoms that occurred were pain, sores, and itching around the genitals.

Conclusion: Most cases of penile squamous cell carcinoma treated with radiotherapy. The patients were in the age range of 45-60 years old where most of them were from the Batak tribe, with enlarged inguinal lymph nodes. The investigations showed there were abnormalities and the patients experiencing stage 4. They were treated operatively with total penectomy. The clinical symptoms were a pain in the public area, sores around the genitals, and itching. The patients had dysuria complications as well.

Keywords: *Penile Squamous Cell Carcinoma, Management, Radiotherapy.*

INTRODUCTION

Squamous cell carcinoma (SCC) of the penis is rare cancer originating from epithelial cells in the inner prepuce or glans penis.[1] Its rare incidence worldwide makes it difficult for research and clinical trials to be standardized in the management of this penile cancer.[2] The most common manifestation of penile squamous cell carcinoma is the presence of a visible and palpable lesion on the penis, which is accompanied by pain, discharge, bleeding, or a foul odor if the patient postpones treatment. These lesions can be nodules or ulcers and might be caused by phymosis.[3]

Radiotherapy is a branch of medicine that deals with the treatment of oncological diseases through ionizing radiation. Ionizing radiation is used since it can form ions (electrically charged particles) and store energy in the tissue cells that pass through it. This stored energy can kill cancer cells or cause genetic changes that result in cancer cell death. [4,5]

METHOD

This study employed a descriptive research design with a retrospective approach, namely by looking at the results of the radiotherapy treatment in patients with penile cancer or squamous cell carcinoma at the Arifin Achmad Hospital for the period of 2014-2019.

The population in this study were penile squamous cell carcinoma patients undergoing radiotherapy management at the Arifin Achmad Hospital from 2014 to 2019. The sample was patients diagnosed with penile squamous cell carcinoma who underwent radiotherapy management based on Minang, Batak, Javanese, and Malay tribes at Arifin Achmad Hospital from 2014 to 2019.

The variables used in this study were age, tribe, clinical symptoms, physical examination, investigations, management (total penectomy, partial penectomy, inguinal lymph node dissection, and radiotherapy), and complications. This study has passed the ethical review by the Medical Research Ethics Unit of Riau University.

RESULTS

Table 1 Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on age

Operative Procedures	Persentage (%)
Total Penectomy	1000
Partial Penectomy	0
Node Lymph inguinal disection	0
Total	100

Table 2 Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on tribe

Age (year)	Persentage (%)
1. >45	**6.,6**
2. 46-55	33.3
3. 56-65	0
4. >65	0
Total	100

Table 3 The frequency distribution of squamous squamous carcinoma patients in the penis is treated with radiotherapy based on physical examination.

Tribe	Persentage (%)
1. Batak	66.6
2. Melayu	33.3
Total	100

Table4: Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on supporting examination

Physical Examination	Percentage (%)
1. Enlargement of Inguinal Lymph Nodes	100
Total	100

Table 5*: Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on stage*

Supporting Examination	Persentage (%)
1. Hemoglobine	
Normal	3.3
Abnormal	**66.6**
	100
Total	
2. Ureum	0
Normal	**100**
Abnormal	100
Total	
3. Creatinine	0
Normal	**100**
Abnormal	100
Total	
4. CT-Scan Pelvic	0
Normal	**100**
Abnormal	100
Total	

Table 6 Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on operative procedures

Stage	Persentage (%)
0	0
1	0
2	0
3	0
4	**100**
Total	100

Table 7 Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on clinical

Operative Procedures	Persentage (%)
Total Penectomy	1000
Partial Penectomy	0
Node Lymph inguinal disection	0
Total	100

Table 7.1 Number of radiation exposure doses in squamous penile carcinoma patients

Clinical Symtoms	Persentage (%)
1. Pain	**100**
Total	100
2. Sores	**100**
Total	100
3. Itchy	**100**
Total	100

Patient	Illuminations	Irradiation Dose	Dose Total
1	35 x	35 x 1,8 Gy	6300 cGy
2	35 x	35 x 2 Gy	7000 cGy
3	40 x	25 x 1,8 Gy + 10 x 2 Gy	7000 cGy

Table 8 Frequency distribution of penile squamous carcinoma patients treated with radiotherapy based on complications

Complication	Percentage (%)
1. Dysuria	**66,6**
2. Stenosis urethra	0
3. Fistula	0
4. Erectile disorders	0
Total	66,6

DISCUSSION

Table 1 presents that in patients with penile squamous cell carcinoma who underwent radiotherapy management based on the largest age group at Arifin Achmad Hospital, Riau Province in 2014-2019, there were 2 cases of age above 45 years old (66.6%). This is in line with a study conducted by Zuhirman Z (2019) which found the highest incidence of penile squamous cell carcinoma between the ages of 40-55 years old, 22 cases (62.5%).[6] It is also reported by a study conducted by Tranggono and Prayoga (2015) which get the most patients in the age range of 40-60 years old (26.1%) (26,1%).[7] A study

conducted by Ottenhof SR et al concluded the factors that were significantly associated with the advanced presentation were men aged 45-55 years old, the presence of comorbidities, and patients who were not insured.[2] Likewise, a study by Favorito LA et al (2008) suggests that penile cancer affects mainly older men between the age of 50 to 70 years old, whereas patients under the age of 35 are not uncommon in Brazil.[8] This suggests that an increase in the incidence of penile squamous cell carcinoma is in accordance with increasing age. Risk factors might increase along with age due to accumulated damage to DNA cells over time.[9]

Table 2 visualizes that most patients with penile cancer or penile carcinoma who were treated with radiotherapy based on the tribe were Batak with 2 cases (66.6%). Meanwhile, the other 1 case was Malay (33.3%). This supports a finding of a previous study conducted by Zuhirman (2019) which found that the highest incidence of the Batak tribe was 12 cases (60%).[6] The Batak tribe is the majority who do not require that their people be circumcised, which causes the incidence of penile cancer to be higher in this tribe.[10] According to the journal of the American Cancer Society (2018), men who were circumcised as children have a much lower chance of developing penile cancer than those who did not. In fact, some experts suggest that circumcision during infancy prevents this cancer. The same protective effect is not seen during circumcision is performed in adulthood.[9] A recent systematic review by Larke *et al* (2011) found a strong protective effect of early circumcision in invasive penile cancer with an odds ratio (OR) of 0.33. In contrast, circumcision in adulthood appears to increase the risk of invasive disease (OR 2.71), but the outcome might be due to selection bias.[11]

It can be seen from Table 3 that in patients with penile squamous cell carcinoma, radiotherapy was treated on 3 cases (100%) who had enlarged lymph nodes. This is in line with a study conducted by Reza and Umbas (2014) which reported 76% positive lymph nodes. Palpable lymph nodes can be suspicious of lymph node metastasis. From the physical examination, it should be noted the number of palpable nodes on each side and note if the nodes are fixed or mobile.[1] A study by Jiao Hu *et al* suggested that inguinal lymph nodes are the first site of metastasis in penile cancer. The presence of inguinal lymph node metastases is one of the most significant prognostic factors for patients with penile cancer.[12] Likewise, the study of Ficcara V *et al* reported that penile squamous cell carcinoma is commonly characterized by regional lymph node spread in a gradual pattern before distant metastases. From the clinicopathological features of the primary disease, the presence and extent of lymphatic metastases to the ilioinguinal area are the most important prognostic factors for survival.[13]

Table 4 presents that 2 patients (66.6%) experienced a decrease in hemoglobin in penile squamous cell carcinoma, while 1 patient was normal (33.3%). A total of 3 patients experienced an increase in the amount of urea and creatinine levels. Meanwhile, 2 patients (66.6%) had abnormal pelvic CT scans to imaging has shown that the sensitivity is as high as 88-100%, with a specificity of 98-100% for confirming metastatic nodules in patients with palpable inguinal lymph nodes.[1]

Table 5 presents that in patients with penile squamous cell carcinoma who underwent radiotherapy management based on stage, all cases were at stage 4. This is in line with a study conducted by Prayoga (2015) which found that the highest incidence was stage 3b and stage 4 as much as 40%.[7] In a study conducted by Brosman SA *et al* (2018), 30 penile cancer patients with stage 3 or 4 with regional metastatic disease. In stage 4, cancer has spread to tissues near to penis such as the prostate, and may have spread to lymph nodes in the thigh or pelvis, or one or more lymph nodes in the pelvis, or cancer has metastasized.[14]

Table 6 showed that in patients with penile squamous cell carcinoma who underwent radiotherapy management based on operative management, it was found that the highest number was a total of 3 cases (100%). This finding supports the finding of a previous study conducted by Zuhirman (2019) which reported that the primary treatment for penile cancer was mostly carried out by total penectomy in 13 cases (37.1%) at Arifin Achmad Hospital.[6] A study conducted by Kusmawan *et al* (2012) reported that 8 cases (17.4%) in Sanglah Hospital underwent a total penectomy with lymph node dissection. A study by Ke Zhang *et al* (2017) also reported that all 12 patients received surgical therapy including total penectomy.[15]

Table 7 showed that patients with penile squamous cell carcinoma were treated with radiotherapy based on clinical symptoms and prognosis of penile squamous cell carcinoma patients. There were 3 patients who experienced pain and large sores around the genitals, while 2 patients experienced itching after being given radiotherapy treatment. The prognosis of 3 out of 3 patients was good. Radiotherapy is currently a central and important choice of effective treatment programs for cancer

worldwide. This treatment is used to provide local control and cure localized cancer (without recurrence in the treated area) or relieve symptoms in cancer that develops or spread locally.[1] According to a study conducted by Baskar R *et al* (2012), this treatment can improve local control, provide good organ preservation results, and inhibit distant microscopic metastases.[16] A study conducted by Ke Zhang *et al* (2017) also stated that as many as 12 patients had dysuria and had erosive wounds large enough to affect their quality of life.[15]

Table 8 showed that in patients with penile squamous cell carcinoma who underwent radiotherapy treatment based on complications, it was found that 2 cases (66.6%) experienced dysuria after receiving radiotherapy treatment. This finding supports a previous study conducted by Tranggono and Umbas (2015) which concluded that the complication that often occurs is meatal stenosis (15-30%) urethral strictures (20-35%).[17] In a study conducted by OW Hakenberg *et al* (2014), it is stated that the common complications that often occur are meatal stenosis (10-35%) and unavoidable urination.[1] The main drawback of radiotherapy is that it can damage healthy tissue that is close to cancer cells. The skin in the treated area often becomes reddish and becomes sensitive. Penile cancer patients may feel a burning sensation when urinating. The area might also temporarily swell for a while.[18]

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