

## Epidemiological, Diagnostic and Therapeutic Profiles of Patients Treated with Concurrent Chemoradiotherapy (CcrT) In Ouagadougou (Burkina Faso)

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### ABSTRACT

Introduction: Cancer was the second leading cause of death in hospitals after cardiovascular disease in Burkina Faso in 2020. Radiotherapy is involved in the treatment of 60 % of cancers. The radiotherapy center inaugurated in April 2021 allowed to irradiate cancer in Ouagadougou for the first time. Thus, it was possible to perform concurrent chemoradiotherapy (CCRT). The aim of our study was to describe the epidemiological, diagnostic and therapeutic profiles of cancer patients treated with CCRT in Ouagadougou.

**Materials and methods:** Descriptive cross-sectional study with retrospective collection from May 1, 2021 to April 30, 2022 from the medical records of patients who have benefited from a CCRT. Included in the study was any patient with a confirmed cancer diagnosis whose medical record was presented in a multidisciplinary meeting (MDM) with validation of a neoadjuvant or exclusive CCRT. Chemotherapy was performed in the clinical hematology oncology department and radiotherapy in the radiotherapy center of University Teaching Hospital Bogodogo.

**Results:** We included 41 patients. The mean age was 54.85 years [35 to 80 years]. Women accounted for 90.2% of cases. Cervical cancers accounted for 87.8% of cases, followed by ENT cancers with 7.3%. Squamous cell carcinoma was the most common histological type. External radiotherapy was used with total doses ranging from 50 to 70 Gy. Chemotherapies were cisplatin (40 mg/m<sup>2</sup>) or carboplatin (AUC2).

**Conclusion:** CCRT has improved the treatment of cancer patients who previously only received chemotherapy and/or surgery when medical evacuation out of the country was not possible.

**Keywords:** Concurrent chemoradiotherapy; Cancers; Ouagadougou

## INTRODUCTION

Cancer is a major public health problem worldwide [1]. According to Globocan 2020, there are an estimated 19.3 million new cancer cases worldwide and nearly 10 million cancer deaths [2]. Every year in Africa, there is an increase in the number of new cases of cancer; about 1.1 million, and up to 700,000 deaths from this disease. Alarming projections indicate that cancer mortality rates in Africa will increase exponentially in the next 20 years, exceeding the global average by 30 [3]. Burkina Faso, a low-income country, is not on the fringes of this phenomenon. Cancer is the second leading cause of death from non-communicable diseases recorded in hospitals after cardiovascular diseases. In 2020, the number of new cases was estimated at 12,045 with 8,695 deaths [3]. The specific treatments of cancers are function of several factors including the stage. Radiotherapy is involved in the treatment of 60% of cancers [4]. In Burkina Faso, radiotherapy, inaugurated in April 2021, allowed to irradiate cancer in Ouagadougou for the first time. Thus, it was possible not only to irradiate patients but also to achieve CCRT of cancers. The aim of our study was to describe the epidemiological, diagnostic and therapeutic profiles of cancer patients treated with CCRT in Ouagadougou in the form of a preliminary study in a country with limited resources.

## MATERIALS AND METHODS

It was a descriptive cross-sectional study with a retrospective collection carried out from 1 May 2021 to 30 April 2022 in Ouagadougou. The data was collected from the medical records of patients who received CCRT at the University Hospital Center of BOGODOGO. Was included in the study, any patient with a confirmed diagnosis of cancer on pathological examination whose medical record was presented in multidisciplinary meeting (MDM) that validated the indication of neoadjuvant or exclusive CCRT. Chemotherapy was performed in the clinical hematology oncology department and radiotherapy in the radiotherapy department of University Teaching Hospital Bogodogo. Any CCRT patients with incomplete medical records with less than 75% completeness were not included.

Chemotherapy protocols for CCRT met international recommendations based on tumor locations:

- For cervical cancers, the cisplatin protocol at 40 mg/m<sup>2</sup> weekly for at least 5 weeks was administered.
- Esophageal cancers benefited from the carboplatin protocol (AUC2) and paclitaxel 40 mg/m<sup>2</sup> weekly for 5 weeks.
- For cancers of the ENT sphere (larynx, maxillary sinus, upper jaw), the cisplatin protocol at 40 mg/m<sup>2</sup> weekly for at least 5 weeks was administered.
- In case of contraindication to Cisplatin, carboplatin was used weekly AUC5.
- Radiotherapy was administered by a Halcyon-type linear accelerator (Varian) delivering intensity modulated volumetric irradiation (VMAT) and the doses administered were dependent on the organ involved:
  - Cervical cancers had a total dose between 45 and 70 Gy.
  - Esophageal cancers received a total dose of 50.4 Gy.
  - ENT cancers received a total dose of 70 Gy.

A data sheet was used to collect data for our study. We collected data on:

- Patient identity: age, gender, occupation and place of residence;
- The clinical data of the patients namely the date of the beginning of the symptomatology, the date and the reason of the 1st specialized consultation, the risk factors of cancer (alcohol and tobacco consumption, the notion of tumor pathology in the family), comorbidities and tumor location;
- Pathological data: histological type, degree of tumor differentiation, vasculo-nerve embols and lymph node involvement;
- Chemotherapy data: protocol, dose, total number of treatments, number of treatment deferrals and reasons for such deferrals and side effects after chemotherapy; hematological toxicities were graded according to the World Health Organization (WHO) evaluation criteria;
- Data on radiotherapy: total dose, fractionation, spreading, number and reasons for postponement of session but also side effects related to radiotherapy;
- The data on the evolutionary aspect: the date of the last contact, the patient's fate and the duration of his follow-up since the diagnosis.

The collected data was entered with the software Epi info 7. The software Epi Info 7 and Excel 2016 were used for the analysis and creation of the graphs. The overall survival curve was drawn according to Kaplan Meier's method.

## RESULTS

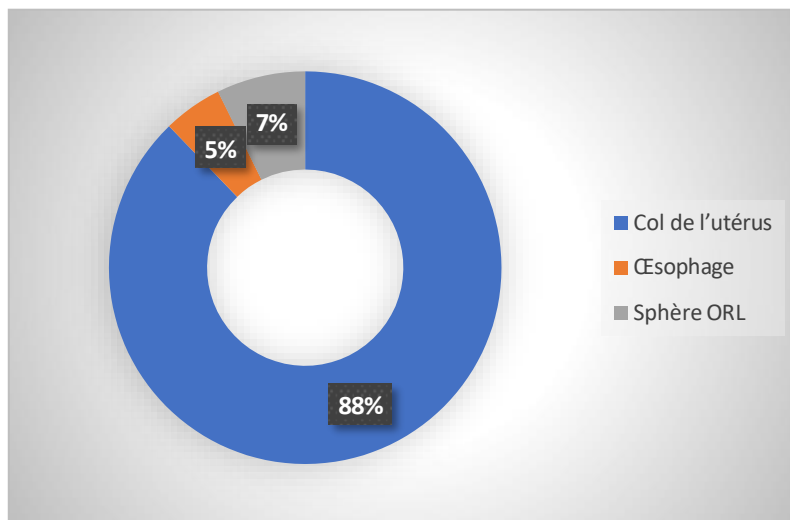
During the study period, 118 patients received radiotherapy at the Bogodogo Radiotherapy Centre. CCRT involved 41 patients (34.8%). The mean age of our patients was  $54.9 \pm 12.4$  years with extremes of 35 and 80 years. Women accounted for 90.2% of cases with a sex ratio of 0.11. Urban residents had 39 patients (95.1%) and 2 patients (4.9%) in rural areas.

There were 24 housewives or 58.5% of patients followed by those in the informal sector with 22%. Table I represents patients by socio-professional activity.

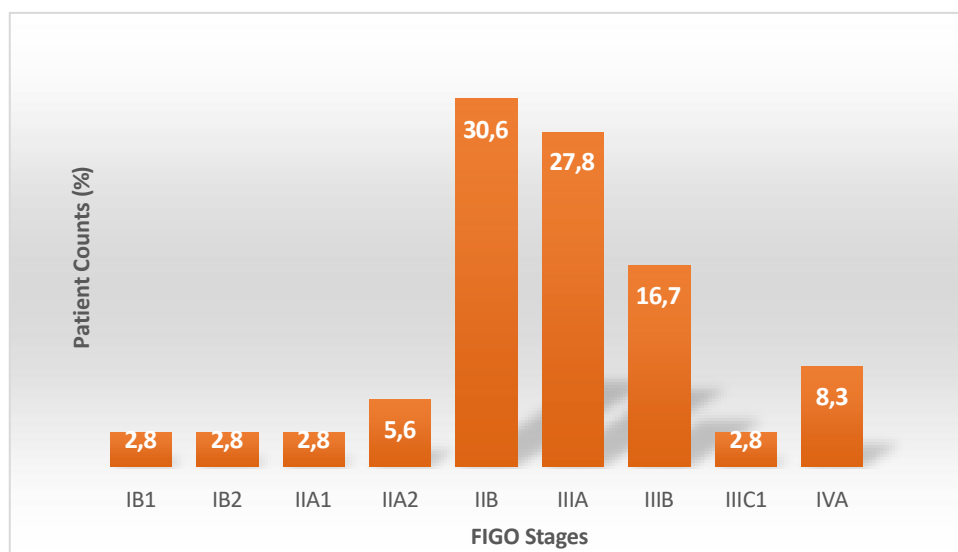
**Table 1:** Distribution of patients by socio-professional activity

Professions	Effective	Percentages (%)
Housewives	24	58,5
Informal sector	9	22
Retirees	6	14,6
Officials	2	4,9
<b>Total</b>	<b>41</b>	<b>100</b>

Cervical localizations represented 88% of patients followed by those of the otolaryngological (ENT) sphere in 7% (cancer of the larynx, sinus of the face and upper jaw). The distribution of patients according to the location of the malignant tumor is represented by Figure 1. Figure 2 presenting the FIGO classification of cancers and cervix and Table II, the TNM classifications of ENT cancers and esophagus. CRC was performed based on cancer locations:



**Figure 1:** Distribution of patients by malignant tumor location n = 41.



**Figure 2:** FIGO classification of cervical cancer n = 36.

Cervical cancers numbered 36. The average age was  $54.6 \pm 11.4$  years with extremes of 36 and 80 years. The reasons for the first consultation were dominated by metrorrhagia (76.5%), pelvic pain (44.1%) and hydrorrhea (38.2%). Table III shows the reasons for consultation with cervical cancer patients. The most common FIGO stages were IIB, IIIA and IIIB with 30.6%, 27.8% and 16.7% patients respectively. Squamous cell carcinoma was noted in 34 patients (94.4%) and adenocarcinoma in 02 patients (5.6%) who all received chemotherapy according to the cisplatin protocol at 40 mg/m<sup>2</sup> each week for at least 08 weeks. The number of chemotherapy treatments received by patients was on average  $6.3 \pm 1.4$  cures with extremes of one (1) cure and 08 cures. Postponements of chemotherapy were noted for various reasons which were dominated by neutropenia (89.5%). The distribution of cervical cancer patients according to the reasons for delaying chemotherapy treatment is shown in Table IV. They all received external radiotherapy with a fractionation of 1.8 Gy/fraction in one patient and 2 Gy/fraction in 35 patients. Averaging was 52.4 days 5.4 with a minimum of 36 days and a maximum of 68 days. CRC was exclusive in the absence of brachytherapy.

**Table 2:** Distribution of ENT and esophageal cancers by TNM classification.

Cancer	TNM Classification
ENT Cancer Laryngeal cancer Facial sinus cancer Maxillary cancer	pT3pN2M0 (UICC 2017) cT4bN0M0 (UICC 2017) cT4aN0M0 (UICC2017)
Oesophageal cancer	cT3N1M0 (AJCC 2017)

**Table 3:** Distribution of reasons for consultation of cervical cancer patients.

Reasons for consultation	Effective	Percentages (%)
Metrorrhagia	26	76,5
Pelvic pain	15	44,1
Hydrorrhea	13	38,2
Weight loss	1	2,9
Pollakiuria	1	2,9

**Table 4:** Distribution of cervical cancer patients by reason for delaying chemotherapy treatment.

Reasons for postponing chemotherapy	Effective	Percentages (%)
Neutropenia grade 2 to grade 4	17	89,5
Thrombocytopenia grade 1 to grade 4	8	42,1
Impaired kidney function	3	15,8
Anemia grade 3 and grade 4	3	15,8
Grade 3 Asthenia	1	5,3%

Regarding esophageal cancers, the average age at diagnosis of the two patients was 63 years with 51 years for women and 75 years for men who all lived in urban areas. The woman was a civil servant and the man an informal sector worker. The reasons for the first patient consultation were dysphagia associated with odynophagia. There was no notion of smoking or alcohol. Squamous cell carcinoma was noted in all patients. The TNM classification was cT3N1M0 for these patients. CCRT was neoadjuvant. The weekly carboplatin-paclitaxel chemotherapy protocol was administered in both patients. The dosage was 40 mg/m<sup>2</sup> for paclitaxel and carboplatin AUC2. One received 04 cures of chemotherapy and the other 05 cures. Fractionation was 1.8 Gy per fraction with a total dose

received of 50.4 Gy for both patients. The total number of radiation sessions was 28 in both. Averaging was 41.5 days with 40 days for one and 43 days for the other.

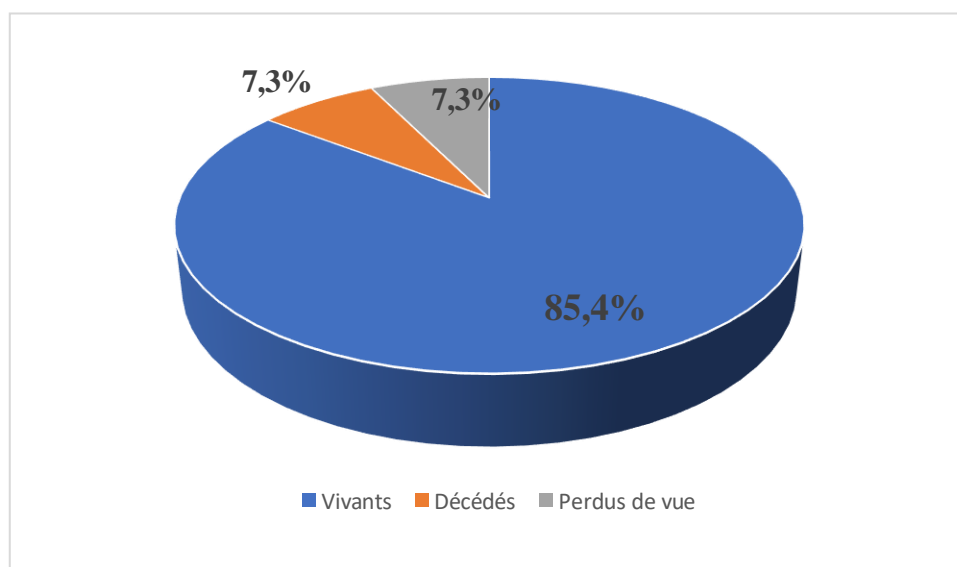
For ENT cancers, the average age of the three (03) patients was 52 years with extremes of 37 and 79 years. They were men and all lived in urban settings. Two (02) of the patients worked in the informal sector and the other was retired. Alcohol-tobacco intoxication was reported in two (02) patients (66.7%). Squamous cell carcinoma was found in all patients. Cancers were:

Laryngeal cancer: the only patient was 37 years old, worked in the informal sector and lived in an urban environment. The reasons for her first consultation were dysphagia and aphonia. Smoking was noted with 30 packs-year. The tumor was at the pT3pN2M0 IVA stage. The CCRT was Adjuvant. The chemotherapy protocol was cisplatin 40 mg/m<sup>2</sup> weekly. He received 8 cures of chemotherapy without postponement of treatment. Radiotherapy consisted of the administration of 2 Gy/fraction with a total dose of 70 Gy. He had 35 radiation sessions with 8 session deferrals for a device failure and holidays. The spread was 59 days.

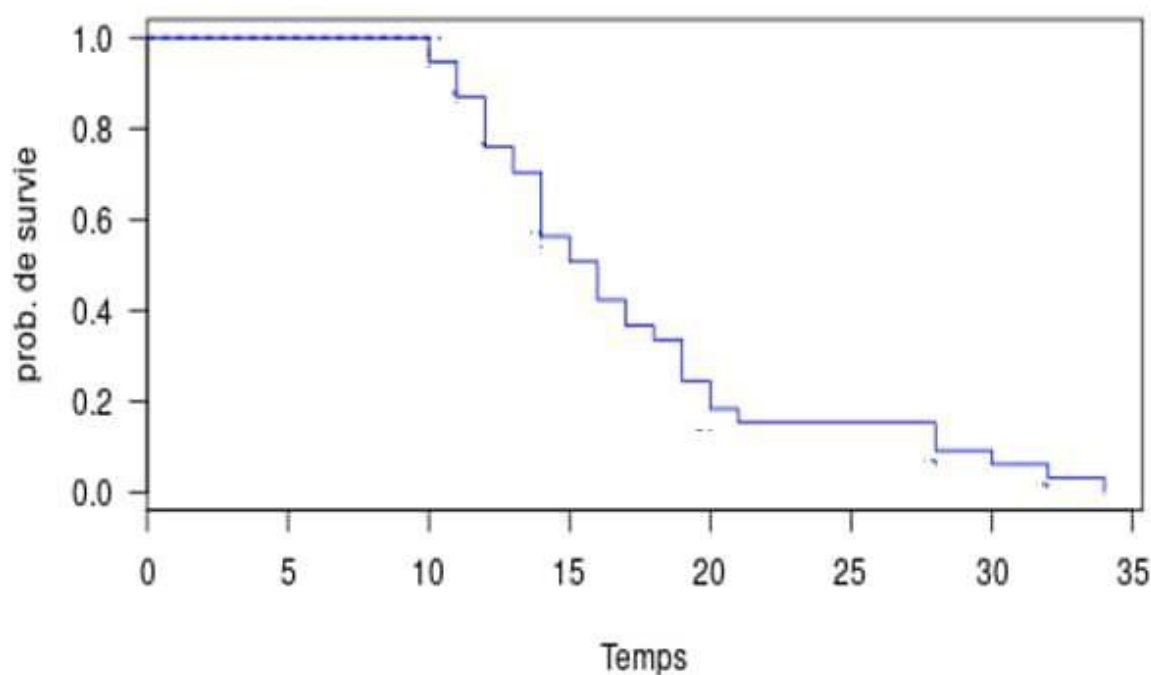
Maxillary cancer: the only patient was 79 years, lived in an urban setting and was retired. The reason for his first consultation was toothache. There was no notion of smoking or alcohol. The stage III tumor is classified cT4aN0M0. The CCRT was exclusive. The weekly cisplatin chemotherapy protocol at 40 mg/m<sup>2</sup> was administered in 5 sessions. The dose of 2.2 Gy/day was administered in 5 weeks with a total dose of 70 Gy.

Sinus cancer of the face: the only patient was 40 years, lived in an urban environment and worked in the informal sector. The reason for his first consultation was epistaxis. The patient consumed alcohol. This was beer and liquor consumed at an estimated 31.8 g/day for about 16 years. Classified cT4bN0M0, the tumor was at the IVB stage. CCRT was exclusive. The number of chemotherapy treatments administered according to the cisplatin protocol 40 mg/m<sup>2</sup> weekly was 7 treatments. Radiotherapy fractionation was 2.12 Gy/fraction with a total dose received of 69.96 Gy in 33 sessions.

The evolution of patients with CCRT as of August 31, 2022 was marked by 85.4% of surviving patients and the overall 12-month survival was 75%. Figure 3 shows the fate of patients and Figure 4 represents the overall survival of patients.



**Figure 3:** Distribution of all patients in our series by fate n=41.



**Figure 4:** Overall patient survival curve n= 41.

## DISCUSSION

The average age of our patients was 54.9 years with a female predominance whose sex ratio was 0.1. This could be by the number of cervical cancer (87.8%) in our study. This average age is close to that of Errachdi in Morocco [5]. It is important to remember that cervical cancer is the 2nd most common cancer in women in Burkina Faso after breast cancer with an incidence of 14.6% in 2020 [6].

Cervical cancer still remains a public health problem in countries like ours that need better organization of the fight against this cancer to get out of the stigma as the cancer of developing countries [7]. The average age of cervical cancer patients was  $54.6 \pm 11.4$  years [36 and 80 years]. This average age is close to that of Franco et al, who noted an average age of 59 years for cervical cancer worldwide [8]. Stages III and IV of FIGO were the most noted in our study with 55.6% of cases. The absence of brachytherapy in our context could thus increase the risk of recurrence post CCRT for these advanced stages that have benefited from CCRT alone [9]. Also, the absence of positron emission tomography coupled with computed tomography (TEP-TDM) in our context that would have allowed a better knowledge of prognostic factors and also to better stratify patients according to their risk levels [10].

Esophageal cancers have been noted in patients over 50 years of age which corroborates with data from the literature concerning the often advanced age of over 50 years at diagnosis [11]. Squamous cell carcinoma found in all our patients is explained by the fact it is the most predominant histological type in esophageal cancer [12]. Esophageal cancer is among the most aggressive gastrointestinal cancers Neoadjuvant CCRT was also notified for advanced stages identical to those found in our study [13,14]. However, immunohistochemistry in search of HER2 overexpression could not be performed. Available anticancer drugs were carboplatin and paclitaxel.

For ENT cancers, CCRT is widely practiced for advanced oral cancers in the head and neck area to preserve organs and functions, as well as aesthetics and quality of life [15].

Alcohol-smoking intoxication was noted in 66.7% of patients with ENT cancer. This co-factor has always been implicated in ENT cancers [16].

The average age of occurrence of laryngeal cancers in developed countries is 65 years [17]. Our patient was 37 years and this could be explained by the strong smoking intoxication of this patient who was more than 30 packs/year. Adjuvant CCRT was achieved by the impossibility of per-operative preservation of our patient as suggested by other authors [18].

Maxillary squamous cell carcinomas are difficult to diagnose and treat because of their anatomical specificity without forgetting the poor prognosis [19]. Our only patient was diagnosed at the cT4aN0M0 stage.

Maxillary sinus cancers are very rare cancer and represent 3.6% of head and neck cancers [20].

The evolution of all our patients who have benefited from the CCRT as of August 31, 2022 was marked by 85,4% of surviving patients and overall survival at 12 months was 75%. This overall survival at 12 months does not allow an active conclusion since this is a preliminary study not reaching the 5 years of post-therapeutic surveillance. Also, some current realities could play against a good overall survival at 5 years. This is for example the absence of brachytherapy in our context which is very important to complete the CCRT of locally advanced cervical cancers [21].

## CONCLUSION

The CCRT has made it possible to better treat cancer patients who once only benefited from chemotherapy and/or surgery when medical evacuation out of the country was impossible. Locally advanced stages remain the most encountered clinical profile with a predominance of cervical and ENT cancers among cancers that have benefited from the CCRT. Easier access to immunohistochemistry, targeted therapies and anti-cancer drugs associated with brachytherapy availability could improve CCRT in Ouagadougou with better overall survival at 5 years.

## REFERENCES

1. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer Statistics, 2021. CA Cancer J Clin. 2021;71(1):7-33.
2. Ferlay J, Colombet M, Soerjomataram I, Parkin DM, Piñeros M, Znaor A, et al. Cancer statistics for the year 2020: An overview. Int J Cancer. 2021.
3. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71(3):209-49.
4. Abshire D, Lang MK. The Evolution of Radiation Therapy in Treating Cancer. Semin Oncol Nurs. 2018;34(2):151-7.
5. Errachdi A, Asabbane A, Nkoua Epala B, Hemmich M, Kabbali N, Kebdani T, et al. Cancer avancé du col utérin : aspects évolutif et pronostique. Expérience marocaine. Presse Médicale. 2014;43:e257-64.
6. 854-burkina-faso-fact-sheets.pdf n.d.
7. Cohen PA, Jhingran A, Oaknin A, Denny L. Cervical cancer. Lancet Lond Engl. 2019;393:169-82.



8. Franco I, Viswanathan AN. Radiation oncology management of stage III and IVA cervical carcinoma. Int J Gynecol Cancer. 2022;32(3):231-8.
9. Mayadev JS, Ke G, Mahantshetty U, Pereira MD, Tarnawski R, Toita T. Global challenges of radiotherapy for the treatment of locally advanced cervical cancer. Int J Gynecol Cancer. 2022;32(3):436-45.
10. Annede P, Gouy S, Haie-Meder C, Morice P, Chargari C. Places respectives de la radiothérapie et de la chirurgie dans les cancers du col utérin. Cancer/Radiothérapie. 2019;23(6-7):737-44.
11. Uhlenhopp DJ, Then EO, Sunkara T, Gaduputi V. Epidemiology of esophageal cancer: update in global trends, etiology and risk factors. Clin J Gastroenterol. 2020;13(6):1010-21.
12. Smyth EC, Lagergren J, Fitzgerald RC, Lordick F, Shah MA, Lagergren P, et al. Oesophageal cancer. Nat Rev Dis Primer. 2017;3:17048.
13. Watanabe M, Otake R, Kozuki R, Toihata T, Takahashi K, Okamura A, et al. Recent progress in multidisciplinary treatment for patients with esophageal cancer. Surg Today. 2020;50(1):12-20.
14. Quéro L, Besnard C, Guillermin S, Hennequin C. Actualités en radiothérapie digestive: le cancer de l'œsophage. Cancer/Radiothérapie. 2022;26(6-7):875-8.
15. Sato K, Hayashi Y, Watanabe K, Yoshimi R, Hibi H. Concurrent chemoradiotherapy with intravenous cisplatin and docetaxel for advanced oral cancer. Nagoya J Med Sci. 2019;81(3):407-14.
16. Goffinet M, Ransy P, Bouchain O, Lefebvre P, Moreau P. Alcohol consumption and head and neck cancer. Rev Med Liege. 2019;74:349-53.
17. Obid R, Redlich M, Tomeh C. The Treatment of Laryngeal Cancer. Oral Maxillofac Surg Clin N Am. 2019;31(1):1-11.
18. Leblanc A, Thomas TV, Bouganim N. Chemoradiation for Locoregionally Advanced Laryngeal Cancer. Otolaryngol Clin North Am. 2023;56(2):285-93.
19. Shiga K, Yokoyama J, Hashimoto S, Saijo S, Tateda M, Ogawa T, et al. Combined therapy after superselective arterial cisplatin infusion to treat maxillary squamous cell carcinoma. Otolaryngol Head Neck Surg. 2007;136(6):1003-9.
20. Makino T, Tachibana T, Kariya S, Matsui Y, Matsuzaki H, Fujimoto S, et al. Pathological evaluation of radiotherapy and concomitant intraarterial cisplatin for maxillary sinus cancer. Auris Nasus Larynx. 2020;47(5):881-6.
21. Chargari C, Peignaux K, Escande A, Renard S, Lafond C, Petit A, et al. Radiotherapy of cervical cancer. Cancer Radiother. 2022;26(1-2):298-308.