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RESEARCH ARTICLE

Radiotherapy/Chemoradiotherapy for Geriatric Head and Neck Cancer Patients

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Abstract

Introductıon: In our study, it was aimed to analyze radiotherapy (RT) compliance, acute toxicity results, and survival in geriatric patients with head and neck cancers. **Methods:** In our study, 77 geriatric patients (≥ 70 years) underwent curative RT diagnosed with head and neck cancer between 04.05.2010 and 24.03.2022 in the Radiation Oncology Clinic of Ankara Bilkent City Hospital and Ankara Atatürk Training and Research Hospital were analyzed. The study's primary outcome was RT completion, interruption, and acute adverse events. The study's secondary endpoint was evaluating overall survival (OS) and progression-free survival (PFS). **Results:** The median follow-up period of the study was 10 (range 1-130) months. The median age of the patients at the time of RT was 75 years. (Range 70-86). Most patients were diagnosed with laryngeal cancer (n=35, 45.5%). Of the 77 patients in our study, 71 (92.2%) completed their treatment, and 6 (7.8%) could not complete the radiotherapy course. Patients who could not complete the planned radiotherapy scheme were mostly diagnosed with laryngeal and hypopharyngeal cancer. (p=0.036; OR 1.94 95%CI 0.33-11.30). 71 patients completed treatment, and 67 (94.4%) did not interrupt treatment. In contrast, the treatment had to be interrupted for the last 4 (5.6%) patients. Grade 3 side effects were observed in 6 patients (7.8%). No grade 4 side effects were observed. During the follow-up period, 16 (20.8%) patients died; 61 (79.2%) were alive. Median OS was 9.8 (range 1 to 130) months. There was a significant relationship between OS and primary (p=0.035). Hypopharyngeal patients were significantly lower; nasopharyngeal and nasal cavity tumors have higher OS values. Local recurrence was observed in 6 (7.3%) of the patients and the median PFS was 8.9 (range 1-130) months. **Conclusion:** In patients over 70 with head and neck cancer, definitive chemoradiotherapy (CRT) is a feasible treatment with acceptable toxicity.

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Introduction

Cancer treatment is more complex than before due to many newly developed RT techniques, current immunotherapies, systemic agents, and modernized surgical techniques. The use of increasingly individualized and complex oncological treatments in the geriatric population is a current topic of studies. Geriatric patients (GP) are a heterogeneous group regarding physiology, comorbidity, and general condition.[1] The GP is generally defined as the population whose calendar age is 70 and above.[2] However, it is well-known that chronological age alone is insufficient to evaluate the suitability of treatments for patients. [3,4]

Head and neck cancer incidence increases in the older age group.[5] Surgery, radiotherapy (RT) and chemotherapy are main treatment modalities, and selection varies according to the patient subgroup. RT is applied to 70 Gy, especially in patients who are not operated on for definitive purposes, and acute and chronic toxicities are frequently o observed at this dose value for patients from all age groups.[6] Curative treatment protocols for diseases have been defined independently of age.[6,7] Due to advanced age and comorbid diseases, appropriate, effective, and adequate standard treatments are not often preferred in the geriatric patient group. Serious treatment toxicities concern clinicians, especially in patients with high comorbidity in this group.[7] For example, clinicians may prefer lower and palliative doses to patients instead of the curative 60-70 Gy dose due to the concern of acute side effects. In concomitant chemotherapy applications, different doses and methods can be selected.

The results of studies evaluating the efficacy of treatments in the elderly population are promising. In addition, it has been shown in many publications that calendar age is not directly related to the increase in comorbidity.[3,4] Müller et al reported that calendar age did not significantly affect acute side effects. It was emphasized that the patient's performance and comorbid disease status were more important.[3] In addition, it has been noted that definitive approaches are applicable in this patient group. Avoiding treatment with the worry of side effects may result in missing the chance for appropriate medical treatment.[7] The elderly population is quite heterogeneous and covers a large group. There is very little data in the literature on the early-stage group of HNC patients. At the same time, there are non-randomized retrospective studies on advanced-stage disease. Considering head and neck cancer in particular, additional morbidities such as enteral tube dependence and aspiration can be seen due to acute side effects such as stomatitis, esophagitis, and odynophagia. Although these complications increase with advanced age, they can be observed in patients of all age groups.[7] When determining treatment protocols in geriatric patients, decisions can be made with the frailty scoring systems developed for this patient group , instead of just the calendar age. The patient's general condition, comorbidity, and performance should also be considered. Detailed preliminary evaluation in geriatric patients may contribute to the prediction of possible treatment-related side effects.

Our study aimed to analyze RT-related acute toxicity, treatment completion, treatment interruption, and survival in patients with geriatric head and neck tumors.

Material and Methods

In our study, patients over 70 who received curative RT diagnosed with head and neck cancer between 01.01.2009 and 30.06.2022 in the Ankara Atatürk Training and Research Hospital and Ankara Bilkent City Hospital were analyzed retrospectively. Patient interview information, patient files, dose volume histograms, and electronic system data were used to obtain data. Demographic status of the patients, radiological and pathological disease details, RT interruption and RT completion status, acute side effects, chemotherapy details, surgery details, recurrence status, and last status were noted. The staging was performed per the American Joint Committee on Cancer (AJCC) version 8. The Common Terminology Criteria for Adverse Events (CTCAE) version 5 was used for acute side effect assessment.

Patient Selection

Patients diagnosed with head and neck cancer with pathological evidence, aged 70 and over, receiving RT for curative purposes in XXX Hospital and XXX Hospital Radiation Oncology clinics with complete file data and ECOG 0-3 were included in the study. Patients who started but could not complete their treatment were also included in the study. The exclusion criteria are ECOG 4, lack of pathological evidence, palliative RT, lack of file data, under 70 years of age, undergoing SRS, and palliative RT.

Primary and Secondary Endpoints

In this study, RT acute toxicity, treatment interruption, and treatment completion status were noted in the patient group over 70 years of age. The study's

primary endpoint was treatment tolerance, toxicity, and completion of treatment in the elderly patient group. secondary endpoints were the evaluation of overall survival (OS) and progression-free survival (PFS) in this patient group. The RT start date was accepted as the starting date for the overall survival and PFS. The last control date for patients experiencing the endpoint for OS is the exitus date for those who have died. As the end for PFS, the first event date for relapse was the last control date for non-relapsed patients.

Statistical Analysis

Data were annotated using SPSS version 26 (IBM Corp, Armonk, NY, USA). Descriptive statistics for continuous (quantitative) variables; were expressed as median, standard deviation, minimum and maximum values, and categorical variables were expressed as numbers (n) and ratio (%).The conformity of the variables to the normal distribution was evaluated with Kolmogorov–Smirnov and Shapiro–Wilk tests and nonparametric tests were used because they did not fit the normal distribution. Categorical demographic characteristics of the patients were calculated with Chi-square and Fisher's exact tests. Spearman's rank correlation test was used for Univariate correlation analysis. Kaplan Meier was used in univariate survey analyses and compared with the log-rank test. In multivariate analyses, the Cox regression test was applied. The statistically significant limit was accepted as 0.05 and below.

Results

Our study analyzed the results of 83 geriatric patients who underwent curative RT diagnosed with head and neck cancer between 04.05.2010 and 24.03.2022 in the Radiation Oncology Clinic of Ankara Bilkent City Hospital and Atatürk Training and Research Hospital. The six patients were excluded from the study. The reasons for exclusion from the study are as follows: two patients have missing files and follow-up data, 2 patients have not primary head and neck (colon cancer metastasis and plasmacytoma), and 2 patients have palliative RT. Sixty (77.9%) of the patients were treated in Ankara Atatürk Training and Research Hospital and 17 (22.1%) were treated in Ankara Bilkent City Hospital. The median follow-up period of the study was 9.8 (range 1-130) months. The median age at presentation for RT was 75 (range 70-86). Fourteen (18.2%) patients were female and 63 (82.8%) were male. Primary diagnoses of the patients were 35 (45.5%) larynx; 22 (28.6%) oral cavity; 5 (6.5%) nasopharynx; 5 (6.5%) hypopharynx; 9 (11.7%) major salivary gland and (1. 3%) nasal-paranasal sinus cancers. The most prominent complaints of the applicant were noted. The most common first complaints were as follows; 32 (41.6%) hoarseness; 7 (9.1 %) neck swelling; 14 (18.2%) had sores on the lips and mouth. Pathological examination revealed that the pathology of 72 (93.5%) patients was SCC. In biopsy type evaluation; excisional biopsy in 26 (33.8%) patients; fine needle aspiration biopsy (FNAB) in 16 (20.8%) patients; punch biopsy in 26 (33.8%) patients. According to the stage evaluation; 11 (14.3%) patients were stage 1; 11 (14.3%) patients were stage 2; 20 (26%) patients were stage 3, 29 (37.7%) patients were stage 4, and 6 (7.8%) patients were relapsed. Concomitant chemotherapy was used for 33 (42.8 %) patients. Chemotherapy was not able to be applied due to medical conditions for 41 (53.2 %) patients and chemotherapy data for three patients was not found. Concurrent 30-40 mg/m2 cisplatin was used for radiosensitization with RT. Radiotherapy technique was IMRT in 65 (84.4%) patients and 3D in 12 (15.6%) patients. The median RT dose was 66 (range 29.6 -70) Gy. Only 13 (16.9) of patients received less than 60 Gy; 25 (32.5%) patients received 70 Gy; A dose of 60-70 Gy could be administered to 39 (50.9 %) patients. Patient and treatment details are summarized in Table 1.

Table 1. Patient and treatment details

Parameters		
Age	Median (range)	75 (70-86)
Gender n(%)	Female	14 (18.2%)
	Male	63 (81.8%)
Primary n(%)	Nasopharynx	5 (6.5%)
	Larynx	35 (45.5%)
	Oral Cavity	22(%28.6)
	Hypopharynx	5(6.5%)
	Nasal Paranasal Sinus	1 (1.3%)
	Salivary Glands	9(11.7%)
First Complain	Hoarseness	32(41.6%)
	Wound in Mouth	14 (18.2%)
	Neck swelling	7 (9.1%)
	Others	24 (31.1%)
Pathology	SCC	72 (93.5%)
	ACC	4 (5.2%)
	MEC	1 (1.3%)
Biopsy	Excisional biopsy	26 (33.8%)
	Punch biopsy	26 (33.8%)
	Fine needle aspiration biopsy	16 (20.8%)
	Tru cut biopsy	7 (9.1%)
	İncisional biopsy	2 (2.6%)
Stage	Stage 1	11 (14.3%)
	Stage 2	11 (14,3%)
	Stage 3	20 (2.6%)
	Stage 4	29 (37,7%)
	Recurrence	6 (7.8%)
RT technique	IMRT	65 (84.4%)
	3D	12 (15.6%)
RT Total Doses	Median (range)	66 (29.6%)
	70 Gy	25 (32.5%)
	60-70 Gy	39 (50.9%)
	Less than 60 Gy	13 (16.9%)
Lets Status	Ex	16 (20.8%)
	Alive	61 (79.2)

Abrr: SCC: Squamous Cell Calcer; ACC:Adenoid Cystic Carcinoma; MEC: Mucoepidermoid Cancer; IMRT: Intensity Modulated Ruiiotherapy RT: Radiotherapy

RT interruption and completion status

Of the 77 patients in our study, 71 (92.2%) completed their treatment, and 6 (7.8%) could not. Reason for inability to complete treatment were; deterioration in general condition for 4 patients, death due to pulmonary embolism in one patient. One patient who was ECOG 1 at the start of therapy died at 30 fractions of treatment. It was considered as treatment-related death. The relationship between primary diagnosis and completion of treatment was significant. Patients diagnosed with larynx and hypopharynx at higher risk for non completed RT (p=0.036; OR 1.94 95%CI 0.33-11.30). All 6 patients who could not complete the treatment were male. The relationship between treatment completion and gender was not significant (p=0.287). There was no important relationship between treatment completion status and age (p=0.864), pathological diagnosis (p=0.657), or RT technique (p=0.348). The patients who could not complete the treatment were summarized in Table 2.

Table 2. The patients details who could not complete the treatment

Case	Patient's Detail	Disease	Treatment	Reason of Interrupt	Recurrence	Last status
1	85y, M ECOG 2 155 cm 54 kg	Stage 4 Paranasal sinus cancer	IMRT 62 Gy CT:- Surgery:- Biopsy: FNA AE:Grade2 dysphagia and grade 1 loss weight	Last 2 fraction did not applied due to general situation disorder	No PFS: 29.8 mo	Alive OS: 29.8 mo
2	82 y M ECOG 2 175 cm 67 kg	Stage 3 Oral cavity	IMRT 46 Gy CT:- Surgery: -Biopsy: Excisional biopsy AE: Grade 3 mucositis and esophagitis, grade 1 dermatitis	Treatment stopped at 46 Gy due to general situation disorder	No PFS:1 mo	Alive OS: 1 mo
3	80 y, M ECOG 2 167 cm 55 kg	Stage 2, Supraglottic Larynx SCC	IMRT: 32 Gy Surgery:- CT:- Surgery:- Biopsy: Punch biopsy AE: Insomnia	Treatment stopped at 32 Gy due to general situation disorder	Progression	Ex OS:1 mo
4	72 y , M ECOG 1 179 cm 67 kg	Stage 4 Transglottic Larynx SCC	IMRT: 60 Gy CT:- Surgery:+ Larenjektomi BLND Biopsy:FNA AE: Grade 2 dysphagia	Treatment stopped at 60 Gy due to exitus	Treatment related exitus	
5	73 y, M ECOG 1 165 cm 84 kg	Stage 4, Hypopharynx Ca	IMRT: 29.6 Gy CT:+ concomitant cisplatin Surgery:- Biopsy: Punch AE: Not observed	The patient died when he was at 29.6 Gy due to pulmonary embolism.		Ex
6	78y,M ECOG 2 177 cm, 75 kg	Stage 4, Hypopharynx Ca	IMRT: 40 Gy CT: Neoadjuvant cisplatin 5FU, concomitant cisplatin Surgery:- Biopsy: FNA AE: Not noted	Treatment stopped at 40 Gy due to exitus		Ex Os:1.45

Abbr: SCC: Squamous Cell Cancer; Ex: Exitus; IMRT: Intensity Modulated Radiotherapy ; RT: Radiotherapy; 5FU:5-florourasil-folinik asit ; AE: Adverse Event ; Gy: Gray ; CT: Chemotherapy ; FNA: Fine Needle Aspiration; BLND:Bilateral Lateral Neck Dissection ; PFS: Progression-free survival; OS: Overall Survival

71 patients completed treatment, and 67 (94.4%) of these patients did not interrupt treatment; In 4 (5.6%) patients, the treatment had to be interrupted. Reasons for interruption of treatment were as follows: angina, grade 3 mucositis; grade 3 dysphagia, and machine breakdown. The difference between treatment interruption and age (p=0.921), gender (p=0.172), primary (p=0.451), pathological diagnosis (p=0.220), RT total dose (p=0.398), and RT technique (p=0.532) were not statistically significant. The patients who interrupted the treatment are summarized in Table 3.

Table 3. Details of patients whose treatment was interrupted

Case	Patient's Detail	Disease	Treatment	Reason of Interrupt	Recurrence	Last status
1	74 y, F 160 cm 81 kg	Stage 3 Oral cavity Tongue SCC	RT: 68 Gy IMRT CT: 5c Cisplatin (concurrent) Surgery:-, Biopsy: Punch AE: Grade 3 mucositis Grade 2 dysphagia	5 days break due to grade 3 mucositis	Recurrence:- PFS: 7.3	Alive OS:7.3
2	83 y, M 167 cm 65 kg	Stage 3, Larynx SCC	RT:70 Gy IMRT CT:Concurrent 4 c cisplatin Surgery:- Biopsy: Punch AE: Grade 3 dysphagia	10 days break due to grade 3 dysphagia at 44 Gy	Recurrence :- PFS: 3.5 mo	Alive OS:3.5 mo
3	75 y, M 170 cm 73 kg	Stage 4, Hyphophaynx	RT: 70 Gy IMRT CT: concurrent 2c Cisplatin Surgery:- Biopsy: Punch AE: Grade 2 dysphagia	10 days break due to angina at 56 Gy	Recurrence:- PFS: 9.8 mo	Ex OS:9.8 mo
4	82y, F 155 cm 65 kg	Stage 2, submandibular gland adenoid cystic carcinoma	RT: 60 Gy 3D CT: concurrent cisplatin Surgery: excisional biopsy Biopsy: Punch AE: Grade 2 dysphagia	5 days break due to Linak breakdown	Recurrence:- PFS: 5 mo	Alive OS: 5 mo

Abbr: SCC: Squamous Cell Cancer; Ex: Exitus; IMRT: Intensity Modulated Radiotherapy ; RT: Radiotherapy; AE: Adverse Event ; Gy: Gray ; CT: Chemotherapy ; PFS: Progression-free survival; OS: Overall Survival

Analysis of Acute Side Effects

Patient files and electronic system data were analyzed. Acute side effects noted were as follows: dermatitis in 10 (12.8%) patients; dysphagia in 38 (49.4%) patients; mucositis in 21 (27.3%) patients; weight loss in 10 (12.8%) patients; pain in 4 (5.2%) patients and insomnia in 2 (2.6%) patients. Grade 3 side effects were observed in 6 patients (7.8%). No grade 4 side effects were observed in any of the patients. The patient whose general condition was good and died during treatment was evaluated as treatment-related toxicity (Grade 5). Details of acute side effects are summarized in Table 4.

Table 4. The acute side effect evaluation of patients

Parameters		n (%)
Dermatitis	Observed (total)	10 (12.8%)
	Grade 1	6 (7.7%)
	Grade 2	2 (2.6%)
	Grade 3	2 (2.6%)
İnsomnia*	Observed (total)	2 (2.6%)
RT-related pain	Observed (total)	4 (5.2%)
	Grade 1	3 (3.9%)
	Grade 3	1 (1.3%)
Weight Loss	Observed (total)	10 (12.8)
	Grade 1	6 (7.8%)
	Grade 2	1 (1.3%)
	Unknown*	2 (2.6%)
Dysphagia	Observed (total)	38 (49.4%)
	Grade 1	15 (19.5%)
	Grade 2	21 (27.3%)
	Grade 3	2 (2.6%)
Mucositis	Observed (total)	21 (27.3 %)
	Grade 1	12 (15.6%)
	Grade 2	7 (9.1%)
	Grade 3	1 (1.3%)
	Unknown	1 (1.3%)

*Grade was not noted.

OS and PFS results

During the follow-up period, 16 (20.8%) patients died; 61 (79.2%) were alive. Median OS was 9.8 (range 1 to 130) months (Figure 1). There was no significant relationship between OS and age (p=0.335), gender (p=0.539), pathological diagnosis (p=0.885), RT total dose (p=0.204), and RT technique (p=0.985). There was a significant relationship between OS and primary (p=0. 035)(Figure 2). Hypopharyngeal patients were significantly lower; nasopharyngeal and nasal cavity tumors have higher OS values. Local recurrence was observed in 6 (7.3%) of the patients and the median PFS was 8.9 (range 1-130) months (Figure 3). There were statistically significant differences between PFS and age (p=0.406), gender (p=0.303), primary (p=0.769), pathological diagnosis (p=0.785), RT total dose (p=0.233), and RT technique (p=0.844).

Figure 1

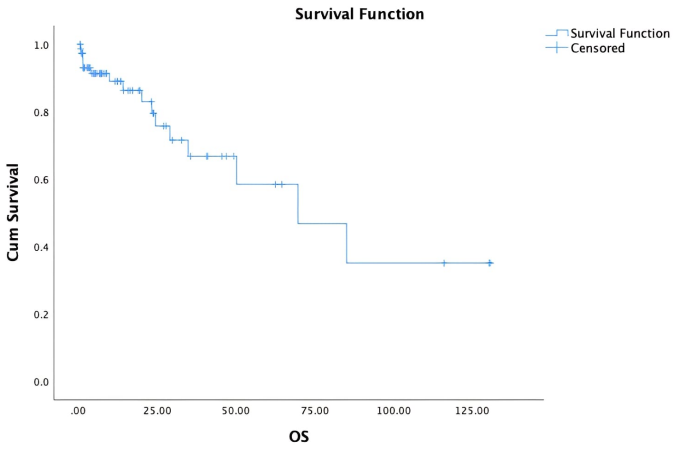


Figure 2

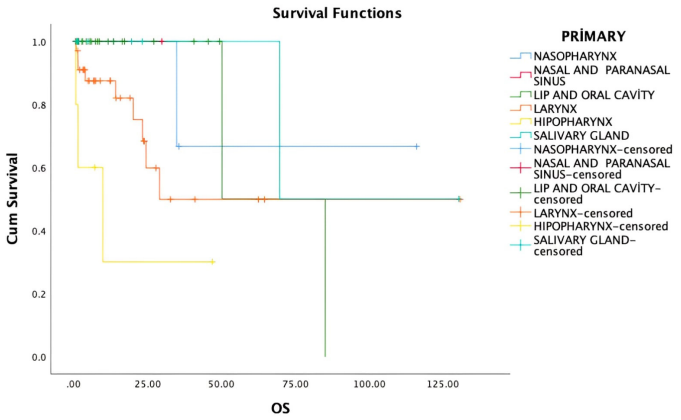
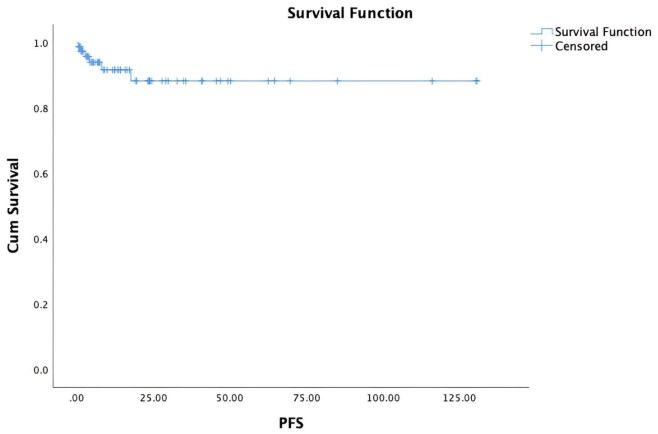


Figure 3



Discussion

In our study, the data of 77 geriatric patients who underwent curative doses of RT with the diagnosis of head and neck cancer were analyzed retrospectively . According to the results, 92.2% of the patients could complete their radiotherapy. These results are promising for the feasibility of curative RT in elderly patients. Grade 3 side effects were observed in 6 patients (7.8%). Treatment-related death was noted in one patient (1.3%). Although the study's follow-up period is short, OS and PFS data are compatible with the literature.

With the increasing elderly population worldwide, the incidence of head and neck cancers in these elderly groups is increasing.[8] Considering the increased comorbidities, loss of cognitive function, multiple drug use, and social factors in the elderly patient group , difficulties may be experienced in making treatment decisions and managing.[9] Increasingly, there are studies evaluating treatment outcomes in this patient population in the literature. Studies have reported data on acute toxicity, which significantly affects treatment compliance, applicability, and success. Sarini et al. reported that

treatment-related deaths increased progressively in head and neck cancer patients according to the patient's age, 4.6% for <40 years old, vs 9. 5% for 40-74 years old vs 11.1% for 75 years old and above respectively (p=0.04).[10] In the study published by Haehl et al. in 2020 with a similar patient group to our study, grade 3 and 4 side effects were reported in 56.1% of the patients.[11] In the study of Bledsoe et al., grade 3 was seen in 42% of patients.[12] In the 2020 publication of Benhmida et al., acute grade 3 adverse events were noted as 5%.[13] Our study noted grade 3 side effects in only 7.8% of patients. The literature shows very different acute side effects values have been reported. This difference may be due to the patients' general conditions included in the studies, differences in primary diagnosis, applied doses, presence of concurrent chemotherapy, surgical status, and treatment techniques. However, observing such different acute toxicity rates in the elderly patient group in further studies is another research topic.

In this patient group, treatment-related death, which is the nightmare of clinicians, also affects the treatment decision. In the study of Stromberger presented in 2021, 1.2% of the patients died in the first 30 days after chemoradiotherapy.[14] Our study noted treatment-related death in 1 (1.3%) patient. Our data are compatible with the literature in this respect.

Considering the existence of patients with different performance statuses in the elderly patient group, it seems that it is not appropriate to make a treatment decision based on only chronological age alone. The new concept of 'frailty', which is used to decide on treatment in geriatric oncology, has been developed to make these evaluations by taking into account different scores. Frailty is a geriatric syndrome that evaluates the body's increased sensitivity to stressors and its relationship with morbidity, mortality, and treatment toxicity.[15] The necessity of holistic and multidimensional evaluation of geriatric patients in addition to chronological age is apparent. This multivariate group of patients needs to be classified in a standardized way.

For this reason, many up-to-date scores have been developed for geriatric patients. The primary purpose of these scores is to create a tool that predicts the patient's response to treatment and survival.[16,17,18] However, this type of evaluation/scoring could not be performed due to the retrospective nature of our study.

In addition to trying to predict treatment success based on patient performance, other studies for optimal treatment selection in this patient group are based on modifying treatment modalities. One of them is evaluating hypofractionated treatment schemes for radiotherapy. Other topic is concurrent cetuximab treatment, which is believed to be successful with less toxicity in this age group.

There is a general tendency to avoid aggressive treatments and conventional RT regimens where the patient has to come to treatment for a long time. In these patients, hypofractionated regimens and lower doses are usually tried.[19,20] Some studies of hypofractionated regimens reduce the hospitalization of elderly patients with almost all kinds of cancers.[21,22,23] Many studies of hypofractionated regimens in elderly head and neck patients are ongoing.[24] Hypofractionated regimens were not used in this study. Curative high doses of RT have been administered with conventional regimens.

Cetuximab is a monoclonal antibody that can be used mainly in head and neck cancer patients. Studies show the survival benefit of adding cetuximab to RT in patients with locally advanced head and neck cancer.[25,26] However, cetuximab is far from replacing cisplatin in concomitant CRT.[27,28,29] Additionally, cetuximab administered concomitantly with RT may cause an increase in side effects.[30] Our study used no immunological or targeted agent in the patients.

Completing the planned treatment scheme is also a decisive factor in predicting treatment success and taking appropriate patients to curative treatment. In the Haehl et al study, definitive or adjuvant RT was evaluated in patients over 65 with a diagnosis of head and neck cancer, and 86.6% of the patients completed the treatment.[11] In Felice's study evaluating hypofractionation, all patients could complete the RT scheme.[30] In elderly patients with head and neck cancer, better OS is achieved with standard treatments than with substandard treatments.[31] When these high treatment completion rates in elderly patients, decreased side effects due to improved RT techniques, and sub-standard treatments are associated with worse survival, curative RT can be applied in elderly patients.

In stage 4 patients with head and neck cancer, palliation can be provided with definitive doses, and definitive radiotherapy is a reasonable treatment option in this patient group, especially in patients with limited metastases. In our patient group, 37.7% of our patients were stage 4 and were treated with a definitive approach. Our survival analysis results should be evaluated within the context of this data.

The continuation of radiotherapy in patients

with head and neck cancer affects treatment success. Each day of treatment prolongation was associated with a 1.4 % loss of local control.[32] For this reason, we evaluated the status of interrupting the treatment in detail. In this study, 92.2% of the patients could complete their radiotherapy, and 94.4% had no treatment interruption—a limited number of studies in the literature focus on this issue.

One of the weakness of this study is that although frail patients over the age of 70 were included in the study, chronic side effects were not evaluated.

When the studies evaluating curative treatment in elderly head and neck cancer cases are examined, two points draw attention. First, the number of elderly patients in head and neck cancer radiotherapy is increasing, reflected in the research frequency. Second, the number of patients undergoing definitive CRT in studies has gradually increased. There are now studies focusing on radio-chemoradiotherapy. Advances in radiotherapy techniques and better critical organ protection underlie the increase in aggressive and curative treatments for elderly head and neck patients.[33, 34]

Conclusions

In patients over 70 with head and neck cancer, definitive chemoradiotherapy (CRT) is a feasible treatment with acceptable toxicity.

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RESEARCH ARTICLE

The Relationship Between Endometrial Biopsy Results and Covid-19 in Postmenopausal Women

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Abstract

Introductıon: To investigate the impact of Covid-19 infection on postmenopausal bleeding and endometrial sampling results in postmenopausal women.

Methods: Our study is a retrospective study, and it compares the demographic data, transvaginal ultrasound findings, and histopathological results of endometrial biopsies in postmenopausal women who had postmenopausal bleeding or underwent endometrial sampling due to asymptomatic endometrial thickness increase of the groups of those who had and had not experienced Covid-19 at Ankara City Hospital between October and December 2020.

Results: Among the 274 patients included in our study, it was observed that biopsies were taken from 173 (63.13%) due to postmenopausal bleeding (PMB), and from 101 (31.86%) asymptomatic women due to increased endometrial thickness. It was determined that 60 (21.89%) of the women had experienced Covid-19 infection. The mean endometrial thickness in patients who underwent biopsy was 8.93±6.42mm, and no significant difference was observed between the measured endometrial thickness in the groups who had and had not experienced Covid-19 (7.98±4.80 vs 9.20±6.79; p=0.17). It was observed that 37 of the 173 patients (21.39%) who had samples taken due to PMB had experienced Covid-19. In both groups of patients who had and had not experienced Covid-19, no significant difference was observed in the rates of postmenopausal bleeding and in the benign and malignant pathology results from the histopathological examination ($p > 0.05$).

Conclusion: In terms of our study in postmenopausal women, it was observed that Covid-19 infection did not affect the rates of postmenopausal bleeding and endometrial biopsy results.

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Introduction

The Covid-19 infection, which emerged in China by the end of 2019 and quickly led to a global pandemic, has caused illness and death in millions of people.[1,2] While most of the disease's effects primarily result from respiratory involvement, it has also been shown to have long-term effects on other systems.[2,3] From the start of the pandemic until the present, numerous studies have investigated the effects of the pandemic on the female reproductive system.[3-5] The most widely studied pathogenetic mechanism being the virus causing genetic expression changes in endometrial cells.[4,6,7]

Endometrial cancer is the most common gynecological cancer in women in developed countries, and its incidence is steadily increasing.[8,9] Approximately 80% of patients are in the postmenopausal period, and vaginal bleeding is present in 90% of patients.[8,10] In postmenopausal women, the likelihood of developing endometrial cancer increases with the presence of obesity, diabetes, hypertension and endometrial hyperplasia.[8,11] Histopathological examination is strongly recommended in women with postmenopausal bleeding, especially if the endometrial thickness is >5 mm.[12,13] While the exact threshold for endometrial thickness is not clear for asymptomatic women, especially with the presence of risk factors, sampling at 8 mm and above is important for early diagnosis of endometrial cancer.[8,11]

Previous studies have shown the effect of Covid-19 infection on the female reproductive system and endometrial cells. It is stated that especially endometrial Angiotensin II (ACE 2) and inflammatory mechanisms are effective in pathogenesis.[4,6,7] In addition to these studies, there are also studies stating that endometrial tissue becomes thinner and reproductive functions are negatively affected due to hormonal changes caused by infection.[14,15]

The aim of our study is to assess the impact of Covid-19 infection on postmenopausal bleeding and endometrial biopsy results in postmenopausal women who underwent endometrial sampling due to postmenopausal bleeding and increased endometrial thickness.

Material and Methods

Our study is a retrospective cohort study, with the necessary ethical approval for the research obtained from the Ankara Yıldırım Beyazıt University Health Sciences Institute ethics committee (decision no: 2022-650). The files of patients who underwent endometrial sampling during the postmenopausal period throughout the 3-month period covering October to December 2020 were included in our research. The files of patients who had postmenopausal bleeding and of those who underwent procedures due to asymptomatic postmenopausal endometrial thickness increase were scanned. Demographic data, indications for endometrial sampling, endometrial thickness in transvaginal ultrasound, Covid-19 infection status, body mass indices (BMI), pathology results, and the patients' comorbidities were recorded. Patients using tamoxifen, patients with chronic conditions posing a risk (hypertension, diabetes mellitus), those with known gynecological precancerous diseases and patients under the age of 40 who entered menopause were not included in the study. In our clinic, endometrial sampling is performed on women with postmenopausal bleeding and asymptomatic postmenopausal women with an endometrial thickness ≥ 8 mm, regardless of risk factors. The files related to our research were collected before the introduction of the vaccine. Percentages and frequencies were used in the statistical analysis of our study, and for continuous variables mean-median, SS and min-max values were employed. Differences between the group that experienced Covid-19 and the group that did not were assessed using t-tests and Mann-Whitney U tests. The Chi-squared test was used for categorical variables. The significance level was taken as $p<0.05$.

Results

In our study, we accessed 352 files of endometrial biopsies performed within the defined period of the postmenopausal stage. After applying exclusion criteria, 274 patient files were included in our study. The mean age of the patients included in the study was 59.93±8.01 (min-max: 44-83), with a median gravida of 3 (range: 1-13) and a median parity of 3 (range: 0-12). It was determined that biopsies were taken from 173 (63.13%) of the women due to postmenopausal bleeding (PMB) and from 101 (36.86%) who were asymptomatic but underwent biopsy due to an increase in endometrial thickness. It was determined that 60 (21.89%) of the women had experienced Covid-19 infection, while 214 (78.61%) had not. Out of the 173 patients who had samples taken due to PMB, it was observed that 136 (78.61%) had not experienced Covid-19, while 37 (21.39%) of them had. 19 (6.93%) patients had malignant pat-

hology results. In terms of postmenopausal bleeding rates and histopathological examination, no significant difference was observed between the group that had experienced Covid-19 and the group that had not ($p > 0.05$). The data is summarized in Table 1.

In the group of patients who underwent endometrial sampling and had experienced Covid-19, the mean age was determined to be 56.96±6.32. The mean age of the group that had experienced Covid-19 was significantly lower than that of the group that had not experienced Covid-19 (p=0.001). The average endometrial thickness in patients who underwent biopsy was 8.93±6.42 mm, and there was no significant difference in the measured endometrial thickness between the group that had experienced Covid-19 and the group that had not (7.98±4.80 vs. 9.20±6.79; p=0.17). In the group that underwent biopsy due to PMB, the mean endometrial thickness in the group that had not experienced Covid-19 was 7.67±5.07 mm, while it was 9.11±7.58 mm in the group that had experienced Covid-19, and there was no statistically significant difference between the two groups in terms of mean endometrial thickness (p=0.45). In asymptomatic women who underwent biopsy, the endometrial thickness was 8.47±4.39 in the group that had experienced Covid-19, and 9.37±5.16 in the group that had not. Similarly, there was no statistically significant difference between the two groups in terms of endometrial thickness (p=0.27). The data is summarized in Table 1.

Table 1

		Covid-19		
	Total	Had	Never had	*P*
Age (years)	59.93±8.01	56.96 ±6.32	60.77±8.25	0.001*
Gravida	3.97±2.05	3.51±1.40	4.09±2.18	0.068*
Parity	3.22±1.56	3.05±1.17	3.26±1.64	0.27*
BMI (kg/m²)	32.06±6.12	33.36±2.97	31.75±6.67	0.045*
Endometrial thickness (mm)	8.93±6.42	7.98±4.80	9.20±6.79	0.17*
PMB	8.80±4.67	9.11± 7.58	7.67 ± 5.07	0.45*
Asymptomatic thickness increase	9.16±4.99	8.47 ± 4.39	9.37± 5.16	0.27*
Histopathological examination	255(93.07)	56 (21.96)	199 (78.04)	0.92ª
Benign	19 (6.93)	4 (21.06)	15 (78.94)	
Malign				
Postmenopausal bleeding				
Present	173	37 (21.39)	136 (78.61)	0.78ª
None	101	23 (22.78)	78 (77.22)	

Table 1: Comparison of groups based on Covid-19 infection status (PMB: Postmenopausal bleeding, BMI: Body Mass Index, *; Student T-test, a; Chi-squared test)

There was no significant difference in the average age between the patients who were grouped in either of the two categories, malign and benign, of histopathological diagnosis (p=0.23). The endometrial thickness was determined as 13.48±10.03 in the malign group, while it was 8.57±5.93 in the benign group, and a statistically significant difference was observed between both groups (p=0.004). It was observed that in 16 out of the 19 patients with a malignancy in the pathology result (84.25%), biopsy was performed due to PMB. However, malignancy was detected in 3 out of the 101 patients who underwent biopsy due to asymptomatic endometrial thickness increase (2.97%). The data is summarized in Table 2.

Table 2

		Histopathological diagnosis		
	Total	Malign (n=19)	Benign (n=255)	*P*
Age	59.93±8.01	62.05±7.23	59.78±8.06	0.23*
BMI	32.06±6.12	31.68±5.27	27.67±3.63	0.01*
Endometrial thickness		13.84±10.03	8.57±5.93	0.004*
PMB	173	14.81±10.64	8.19±6.41	0.001*
Asymptomatic thickness increase	101	8.66±2.88	9.18±5.05	0.48*
PMB				
Present	173	16 (9.25)	157 (90.75)	0.04ª
None	101	3 (2.97)	98 (97.03)	

Table 2: Comparison of histopathological diagnosis data (BMI: Body Mass Index, *; Student T-test, a; Chi-squared test)

Discussion

Endometrial cancer is the fourth most common cancer among women both worldwide and in our country, and it is the most frequently occurring malignancy among gynecological cancers.[9,16] The risk of developing endometrial cancer over the course of a woman's lifetime is 2.8%.[12] The average age of women diagnosed with endometrial cancer is 63 and more than 90% of endometrial cancer cases are diagnosed after the age of 50.[17] In our study also, the average age was found to be 62, which is consistent with the literature. It was observed that women who had experienced Covid were of a younger age, however, any relationship between having experienced Covid and endometrial cancer was not determined. In accordance with the literature, 84% of patients in our study who had been diagnosed endometrial cancer had postmenopausal bleeding.[8,17] Among the patients who were asymptomatic and underwent biopsy due to endometrial thickness, 2.97% were found to have endometrial cancer, which is also consistent with the literature.[8,11]

Studies have shown that the Covid-19 pandemic has affected the menstrual cycle.[5,18] Primarily in the pathogenesis, it has been reported that endometrial Angiotensin II (ACE 2) and inflammatory mechanisms are effective. During Covid-19 infection, a decrease in ACE2 expression has been demonstrated

in both in vivo and in vitro.[6,7] ACE2 also increases the proliferation of endometrial epithelial cells and stromal cells and affects their regeneration.[19-21] In addition to these studies, there are also studies indicating that the endometrial tissue becomes thinner and reproductive functions are adversely affected due to hormonal changes caused by the infection.[14,15] The impact of Covid-19 on postmenopausal bleeding has been mainly studied in the context of vaccines, and secondary to vaccination, it has been reported that there has been an increase in postmenopausal bleeding.[22,23] In our study, we observed that in the group that had experienced Covid-19 there was no significant difference in endometrial thickness compared to the group that had not experienced Covid-19, both in those with and without postmenopausal bleeding. Similarly, no significant difference was observed in the rates of postmenopausal bleeding between the group that had experienced Covid-19 and the group that had not.

It has been shown that Covid-19 infection has a negative impact on the prognosis of endometrial cancer.[6] However, the effect of decreased ACE2 expression due to viral infection on malignant transformation in normal endometrial cells is not known. In our study, no significant difference was observed in terms of the detection of malignancy in the histopathological examination between patients who had experienced Covid-19 and those who had not.

Independent of having experienced Covid-19 infection, patients with a malignancy in the pathology result exhibited a significant difference in endometrial thickness compared to benign women, with an probability of cancer increasing as endometrial thickness increases. This finding is consistent with the results of previous studies.[8,11] Additionally, the BMI was higher in the malignancy group than it was in the benign group, and obesity is a well-known risk factor for endometrial cancers.[12]

According to the results of our study, in the samples taken from postmenopausal women, the main risk factor for obtaining a malignant result was PMB. Having experienced Covid-19 did not show a significant relationship with the rate of PMB and endometrial cancers in our study population. The limitation of our study was the lack of data on factors that could affect the prognosis, such as the severity of Covid clinical manifestations and the type of endometrial cancer. Additionally, our study had a limited number of cases due to being highly selective in its criteria. However, it is important because it is one of the few studies regarding the impact of Covid-19 infection on postmenopausal bleeding and endometrial histopathological diagnoses, especially among the unvaccinated population. More comprehensive research is needed to determine the long-term relationship between endometrial cancer and postmenopausal bleeding and to understand their etiopathogenesis.

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RESEARCH ARTICLE

Exploring Emergency Department Workers' Attitudes Towards Individuals with Suicide Attempts: A Cross Sectional Study

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Abstract

Introductıon: This study aims to determine the attitudes of emergency service workers toward patients attempting suicide (PAS) and the factors influencing these attitudes.

Methods: A total of 122 voluntary emergency service workers employed in a city hospital participated in the research. Data were collected using the "Attitude scale towards attemnpted suicide cases for evaluating emergency medical teams (ASETSA)." The data were analyzed using ANOVA and Student t-test.

Results: The average age of the participants was 29 ± 6.7, with the majority being male (60%) and in the first five years of their profession (58%). The mean score on the ASETSA was 98.3 ± 8.6. It was determined that variables such as age, gender, education level, marital status, years of service, and weekly working hours did not affect the participants' attitudes towards PAS. A small percentage of workers (7%) reported receiving training on suicide prevention.

Conclusion: The overall attitudes of emergency health workers towards individuals with suicide attempts were positive and not associated with sociodemographic and professional characteristics. It was identified that emergency health workers need more psychiatric training to feel adequately prepared when intervening in cases of suicide attempts.

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Introduction

Suicide is a significant global health issue observed frequently in both high- and low- to middle-income countries.[1-2]Annually, approximately 700,000 individuals die by suicide, and it is known that 20 times that number presents to healthcare institutions due to suicide attempts. Suicide, especially in the young population, ranks among the leading causes of mortality, being the fourth most common cause of death in the 15-29 age group according to the World Health Organization (WHO) 2019 data[1]

In Turkey, according to data from the Turkish Statistical Institute (TSI), the number of suicide-related deaths was 3,406 in 2019, with a reported crude suicide rate of 4.12.[3] The risk of repeated self-harm is considerably high, with past suicide attempts being a crucial risk factor for completed suicide. Among the factors influencing the recurrence of suicide attempts and completed suicide, variables related to the patient's specific illness, stress factors, personality traits, and the quality of treatment services are considered.

The majority of patients attempting suicide (PAS) primarily seek assistance in emergency departments, where assessments determine referrals to outpatient clinics or inpatient services based on treatment plans. Therefore, emergency service workers play a crucial role in managing suicide attempts. The knowledge and attitudes of emergency service personnel toward suicide attempts and self-harming behavior impact the patient's care and treatment adherence.[4] Healthcare professionals intervening in self-harm cases have reported insufficient training in this area, leading to feelings of anger and helplessness when dealing with these patients.[5] Negative attitudes of healthcare personnel have been associated with patients feeling rejected or harboring hostility, potentially leading to further self-harm.[6] Additionally, the staff's attitudes toward suicide may influence patients' decisions to seek help at the hospital. Studies have reported that patients who present with suicide attempts may evoke more negative attitudes or receive less attention, especially from nurses, compared to those with physical illnesses.[5-7] An empathetic and supportive approach can reduce the risk of suicide attempts recurring.[8,9]

This study aims to determine the attitudes of emergency service workers towards individuals who have attempted in a city hospital serving a densely populated city like Ankara. Factors influencing these attitudes related to the personnel and work environment are also investigated to facilitate long-term planning of necessary training programs, prioritizing the determination of the impact of healthcare professionals' attitudes on suicidal behavior.

Material and Methods

Participants:

The study was conducted in the emergency department of a training and research hospital where approximately 2,000 patients present daily. The hospital, comprising four hospitals, forms a city hospital health complex. The hospital has a psychiatry department, and individuals with PAS are initially evaluated by the emergency team and then referred to a psychiatry department for consultation.

During the study period from November 1, 2019, to November 30, 2019, a total of 267 healthcare personnel were working in the emergency department, including 12 (5%) emergency medicine faculty members, 21 (8%) specialist doctors, 52 (19%) assistant doctors, 174 (65%) nurses, emergency medical technicians, and health officers, and 8 (3%) medical secretaries. The aim was to reach all personnel; therefore, all 267 healthcare personnel were approached, and 120 healthcare professionals (doctors, nurses, emergency medical technicians, and health officers) voluntarily participated in the study (response rate: 44%). Information from participating healthcare workers was collected anonymously.

Measurement Tools:

Participants were administered the "Attitude scale towards attemnpted suicide cases for evaluating emergency medical teams (ASETSA)" developed by Er et al. (2013), with established validity and reliability. Additionally, a Socio-Demographic and Suicide-Related Information Questionnaire was created by the researchers based on the study's objectives through literature review. This questionnaire included questions about gender, marital status, education level, occupation, years of service, weekly working hours, duty-taking status, past experience working in the psychiatry department, receiving training on suicide, personal history of suicidal thoughts or attempts, seeking psychological support for mental health issues, and questions related to suicide within the immediate environment or family.

The ASETSA consists of six subscales: "prevention and protection" (5 questions), "individual assistance" (3 questions), "institutional assistance"

(2 questions), "triggers and psychopathology" (7 questions), "causal attributions" (6 questions), and "medical assistance" (5 questions). The total score ranges from 28 to 140, with higher scores indicating a positive attitude towards PAS, and lower scores indicating a negative attitude. Ratings were made on a five-point Likert scale (1 - strongly disagree to 5 - strongly agree). Cronbach's alpha value is 0.84.[10]

Ethical Compliance

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ankara City Hospital Ethics Committee No. 1 on October 03, 2019, with approval number E-19-081.

Statistical Analysis :

Data analysis was performed using SPSS 23.0 software.[11] Descriptive statistics were presented as numbers, percentages, means, and standard deviations. Before conducting univariate and multiple comparisons, normal distribution was assessed using the Kolmogorov-Smirnov test and visual analyses. Student t-test was used for univariate comparisons, and ANOVA was used for comparisons of ASETSA scores based on profession (four categories), years of working in the profession (four categories), and years of working in the emergency department (four categories), as parametric assumptions were met. The correlation between age and ASETSA scores was evaluated using Pearson correlation test. A significance level of $p \leq 0.05$ was accepted.

Results

The mean age of the healthcare personnel participating in the study was 29 ± 6.7. The majority were male (60%), and 58% were in the first 5 years of their professional life. Regarding professional distribution, 9% were emergency medicine faculty members, 16% were specialist doctors, 34% were assistant doctors, 35% were nurses and health officers, and 6% were medical secretaries. In this study, the reliability coefficient (Cronbach's alpha) of the 28-item scale was found to be $\alpha = 0.881$, with a mean score of 98.3 ± 8.6.

When examining suicide attitudes based on the sociodemographic and professional characteristics of healthcare workers, no significant differences were observed in ASETSA scores concerning gender, marital status, having children, education level, occupation, years in the profession, and years working in the emergency department, as presented in Table-1.

Table-1 Comparison of ASETSA Scores of Emergency Service Workers According to Sociodemographic and Professional Characteristics

	n(%)	Mean ± ss	t/F (df)	p
Gender				
Female	48 (40%)	97,5 ± 8,6	-0,844 (118)	0,401
Male	72 (60%)	98,9 ± 8,6		
Marital status				
Married	62 (58%)	97,9 ± 7,9	-0,498 (188)	0,620
Single/Divorced	58 (42%)	98,7 ± 9,4		
Kids				
Yes	43 (36%)	98,8 ± 7,5	0,496 (118)	0,640
No	77 (64%)	98 ± 9,3		
Education status				
High School/Associate Degree	10 (8%)	97,3 ± 9,7	-0,387 (118)	0,700
Undergraduate/Graduate	110 (92%)	98,4 ± 8,5		
Occupation				
Faculty Member	11 (9%)	98,9 ± 7,2	1,185 (4)	0,321
Specialist Doctor	19 (16%)	97,4 ± 8,5		
Researcher Assistant Doctor	41 (34%)	97,1 ± 7,4		
Nurse / Health Officer	42 (35%)	98,8 ± 10,1		
Medical Secretary	7 (6%)	104,4 ± 7,1		
Duration in the profession (years)				
0-5 years	70 (58%)	98,6 ± 8,9		
6-10 years	24 (20%)	95,3 ± 7,9	1,831 (3)	0,145
11-15 years	12 (10%)	102,2 ± 7,7		
16-20 years	14 (12%)	98,2 ± 8,6		
Working Time in the Emergency Department (years)				
0 - 4 years	73 (60,8%)	98,3 ± 8,6	3,01 (2)	0,053
5 - 9 years	26 (21,7%)	96 ± 8,8		
> 10 years	21 (17,5%)	102 ± 7,9		
Weekly Working Time (hours)				
≤ 40 hours	36 (30%)	100,4 ± 9,3	1,804 (118)	0,074
> 40 hours	84 (70%)	97,4 ± 8,2		

ASETSA:Attitude scale towards attemnpted suicide cases for evaluating emergency medical teams, ss: standard deviation df: degree of freedom

There was no significant relationship found between the age of healthcare workers and ASETSA scores (r: -0.25, p: 0.786).

The experience of working in the psychiatry department, receiving suicide training, having a psychiatric illness, a history of suicidal thoughts or attempts, and the presence of a family member with a suicide history were found to have no statistically significant impact on ASETSA scores. The results are presented in Table-2.

Table-2 Comparison of ASETSA scores in terms of features related to suicide knowledge

	n(%)	mean ± ss	t/F (df)	p
Working in a psychiatric ward				
Yes	32 (27%)	98,5 ± 7,8	0,139 (118)	0,889
No	88 (73%)	98,3 ± 8,9		
Getting Suicide Training				
Yes	8 (7%)	100 ± 7,4	-0,953 (118)	0,342
No	112 (93%)	98 ± 8,9		
History of Psychiatric Illness				
Yes	28 (23%)	98,7 ± 6,7	0,252 (118)	0,802
No	92 (77%)	98,2 ± 9,1		
Suicidal ideation/attempt				
Yes	10 (8%)	95,4 ± 9,4	-1,115 (118)	0,267
No	110 (92%)	98,6 ± 8,6		
Suicide Story Nearby				
Yes	15 (12,5%)	94,6 ± 10,9	-1,796 (118)	0,075
No	105 (87,5%)	98,8 ± 8,1		

ASETSA:Attitude scale towards attemnpted suicide cases for evaluating emergency medical teams, ss: standard deviation df: degree of freedom

When the subscale mean scores of AETHW-SAS were evaluated based on the number of questions, they were similar, and descriptive statistics for the subscales are provided in Table-3. When the item mean scores on the scale were compared using one-sample t-tests:

In the "Prevention and Protection" subscale, the item "Suicide is not a solution." had the statistically lowest mean score of 1.6 ± 1 compared to other items ($p < 0.001$).

Additionally, one item from the "Triggers and Psychopathology" Subscale ("Many people who attempt suicide are alone and depressed."), and two items from the "Medical Assistance" Subscale ("I need more psychiatric training to help patients who attempt suicide." and "There should be separate rooms for PAS in the hospital.") had statistically significantly lower mean scores than all other items (Means were 1.99 ± 0.93, 1.91 ± 0.90, 1.98 ± 0.97, respectively; $p < 0.001$).

Table-3 Descriptive Statistics of ASETSA Subscales

AETHW-SAS Subsize	n	minimum	maximum	mean	Standard deviation
Prevention and Protection	120	13	25	18,8	2,1
Individual Help	120	3	15	11,4	2,4
Corporate Aid	120	3	10	7,1	1,7
Triggers and Psychopathology	120	16	28	22,5	2,4
Causal Attributions	120	15	30	23,4	3,7
Medical Help	120	10	20	15,1	1,8

ASETSA:Attitude scale towards attemnpted suicide cases for evaluating emergency medical teams

Discussion

In this study, the attitudes of healthcare professionals working in the emergency department of a city hospital complex towards patients attempting suicide and related factors were investigated. In the study, it was determined that the general attitudes of emergency healthcare professionals towards patients who attempted suicide were positive. There are studies in the literature that evaluate the attitudes of nurses, doctors and emergency medical technicians separately. Research on the attitudes of healthcare professionals towards PAS has yielded different results. As in our study, in three different studies examining the attitudes of healthcare professionals towards patients who attempted suicide, it was reported that nurses had positive attitudes towards patients who attempted suicide.[8,12,13] However, in another study examining nurses' attitudes towards patients who attempted suicide, it was observed that nurses' attitudes towards these patients were negative.[14]

Comparing our results with existing literature, Perboell et al. reported positive attitudes among nurses in Denmark, consistent with our findings.[12] However, it is very important to take into account the inequalities in research methods, measurement tools and samples that may cause conflicting results regarding attitudes towards PAS.[15] Sociodemographic variables such as age, gender, and professional experience have been reported to influence the attitudes of healthcare workers towards patients who have suicide. In our study, there was no relationship found between the sociodemographic characteristics, such as age, gender, marital status, occupation type, and years of experience in the profession and in the emergency department, and attitudes towards patients who attempted suicide. However, although not statistically significant, healthcare workers with 10 or more years of experience in the emergency department had the highest attitude scores. Similarly, Gibb et al.'s study found that the attitudes of healthcare team members providing care to self-harming patients in New Zealand did not differ based on age, gender, or experience.[16] In Perboell et al.'s study, there was no difference in attitudes based on age, but when compared by gender, females had more positive attitudes than males.[12] Additionally, while age did not affect attitudes, long-term experience in the emergency department was reported to increase positive attitude scores due to empathic ap-

proaches. Some studies have also reported that older healthcare workers have more positive attitudes.[8,13,17]

The level of burnout among emergency healthcare workers has been reported to affect their attitudes towards PAS.[16] In this study, we measured workload based on the weekly working hours of employees, indirectly assessing the level of burnout. Although attitude scores towards PAS were higher in individuals working fewer than 40 hours per week, there was no statistically significant relationship between weekly working hours and attitudes towards patients who attempted suicide. The reason why we obtained different results from other studies may be related to the fact that there are many parameters that measure burnout, whereas our study only takes working hours into account

Another variable that could affect attitudes towards PAS is the knowledge and skills of healthcare workers about suicide. The implementation of practical training for healthcare personnel has been reported to increase their confidence, attitudes, knowledge, and skills in caring for self-harming patients.[5] In Perboell et al.'s study, 19% of participants had received suicide-related training, and having received training was reported to have a positive effect on attitude scores.[12] In our study, only 7% of employees had received training on suicide, and there was no relationship between receiving suicide training and attitudes towards patients who attempted suicide. The discrepancy in our study's results may be due to the small number of healthcare workers who received suicide training. However, it was determined that participants received the lowest attitude scores for the items related to education and care on the scale, such as "I need more psychiatric training to help patients who attempt suicide." and "There should be separate rooms for PAS in the hospital." This indicates that the majority of participants did not feel competent in treating patients who attempted suicide and needed training in this area.

The presence of suicidal thoughts/attempts in healthcare workers themselves or in their close surroundings could affect attitudes towards patients who attempted suicide. In this study, there was no relationship found between having suicidal thoughts or attempts in both the employee and their close surroundings and attitudes towards patients who attempted suicide.

While this study's results do not indicate that emergency service workers have negative attitudes towards patients who attempted suicide, it does suggest a need for training in this area. The use of the ASETSA for measuring and demonstrating post-training development is possible. Thus, healthcare workers can develop more positive attitudes towards this patient group and feel more competent in intervening with these patients.

Limitations

When interpreting the results of our study, it is important to consider some limitations. Firstly, since our study was conducted at a single center, the results may not be generalized to all emergency healthcare workers, as they may only reflect the attitudes of those working at this specific center. Additionally, with a participation rate of 44%, the characteristics of non-voluntary or unreachable employees who did not participate in the study are unknown, and it is uncertain whether their attitudes towards patients who attempted suicide are more positive or negative than the sample. The 6-factor structure in the validity study of the PAS scale explained 58% of the total variance in attitudes towards patients who attempted suicide, indicating the presence of unmeasured attitudes.[11] The nature of questions being about attitudes requires accounting for social desirability bias when evaluating relationships, and although participant data were collected anonymously to minimize bias, it is not possible to completely control for bias.

Conclusion

As a result, it shows that emergency department healthcare professionals have positive attitudes towards patients who attempt suicide. It was determined that age, gender, education level, profession, marital status, working time, weekly working hours and whether or not working in shifts did not affect the attitude towards suicide cases. The results cannot be generalized since they only cover the sample group of the study. Another striking finding is that healthcare professionals often need training on how to approach patients who attempt suicide.

In this study, attitudes towards the characteristics of individuals who attempted suicide or the suicide method were not evaluated. Therefore, in future studies, researchers can evaluate attitudes towards PAS using case examples or qualitative methods.

Declarations

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Conflict of interest/Competing interests The-

re is no conflict of interest between the authors.

Ethics committee approval was received from Ankara Bilkent City Hospital Ethics Committee No. 1 on October 03, 2019, with approval number E-19-081.

Availability of data and materials data are stored in written forms. If desired, it can be requested by contacting the responsible author within the framework of information security.

Authors' contributions: Conceptualization, HSÖ; Data curation, MT; Investigation, MT; Methodology, SC; Project management, HSÖ; Audit, HO; Written – original draft, SC; Writing-review and editing, HSÖ

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RESEARCH ARTICLE

Surgical Results Of Chordee Without Hipospadias

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Abstract

Introductıon: Congenital penile curvature is an anomaly that often accompanies hypospadias. It is the abnormal curvature of the erected penis without any abnormality in penile chord meatal position without hypospadias and it is a rare condition. We aimed to review our experiences in the light of the literature by presenting our cases of congenital chordee without hypospadias that we operated on in pediatric patients
Methods: The data of the patients who were operated in our clinic between January 2020 and June 2022 for congenital chord without hypospadias were analyzed retrospectively. Patients who had previous surgical procedures were excluded from the study
Results: Seventeen patients were included in the study. The ages of the patients were determined as 23-176 months (median 91.8 months).It was observed that the chordee degree of the patients was between 30-90 degrees.Seven of the 17 patients had chordee after degloving of the penis, that is, they had skin chordee. Heineke-Mikulicz plication was performed in 5 of the remaining ten patients and tunical plication was performed in 3 patients. Two patients with ventral cords underwent corporotomy and ventral grafting in their follow-up.
Conclusion: The vast majority of penile cords without hypospadias can be corrected with simple degloving or plication techniques. No matter what technique we use, the protection of neurovascular structures and the urethral plate should be our main goal. Although penile cordis without hypospadias is rare, we argue that it can be performed in experienced centers with low complication rates and successful results.

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Introduction

While congenital penile curvature is a defect that often accompanies hypospadias, cordee without hypospadias which is a rare condition is the abnormal curvature of the erected penis in the absence of urethral meatal position abnormality. It is also called hypospadism without hypospadias, pseudohypospadias, congenital short urethra.[1]

The prevalence of penile curvature was found to be 0.037% by Ebbehoj and Metz, and 0.6% by Yachia. Chordee without hypospadias must be a more rare condition although we could not find its prevelance in current literature.[2,3] There is no consensus on the timing and how to treat congenital penile curvature detected in childhood. While some authors advocate early correction, others prefer correction in adolescence.

We aimed to review our experiences in the light of the literature by presenting our cases of congenital chordee without hypospadias that we operated on in pediatric patients.

Material and Methods

The data of the patients who were operated in our clinic between January 2020 and June 2022 for congenital chord without hypospadias were analyzed retrospectively. Patients who had previous surgical procedures were excluded from the study. Indications for surgery: preputial anomalies, family complaints due to penile curvature during erection, and curvature of more than 30 degrees during natural erection on examination.

Picture1,2:Pre-operative chordee pictures

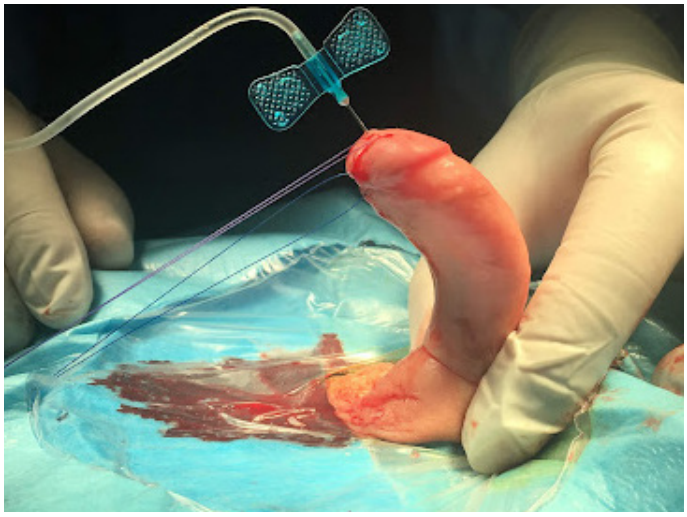
Picture 1

Picture 2

Surgical technique:

In all cases, the penile skin was degloved up to the root of the penis after circumcision incision. After degloving, the degree of curvature was measured with a goniometer, after achieving an artificial erection with a 21-Gauge butterfly needle by applying finger compression to the penopubic region without applying a tourniquet (picture 3). Penile deformity was evaluated in artificial erection, curvature direction, degree, and plaque-containing area were recorded in the operating note. Patients whose penis straightened during the artificial erection test were considered to have skin cord. The chordee type of the patients was classified according to Kramer's classification of chordee without hypospadias.

Picture 3: Per-op artificial erection test



Results

Seventeen patients were included in the study. The ages of the patients were determined as 23-176 months (median 91.8 months).It was observed that the chordee degree of the patients was between 30-90 degrees. It was observed that in 7 of 17 patients, the cordee improved after the penis was degloved with a circumcision incision, that is, these 7 cases had a skin cordee. Of the remaining 10 patients, 5 underwent Heineke-Mikulicz and 3 underwent Baskin. In two patients with ventral cordis, the urethra was cut from the subcoronal region and corporotomy was performed as cordis persisted. Ventral grafting and urethroplasty were performed in the follow-up of the patient who became hypospadic.. It was observed that 5 of 17 patients had circumcision before and only one of them recovered after penile degloving.

Post operative ; Ecchymosis was observed in one patient and hematoma was observed in one patient who underwent corporotomy.

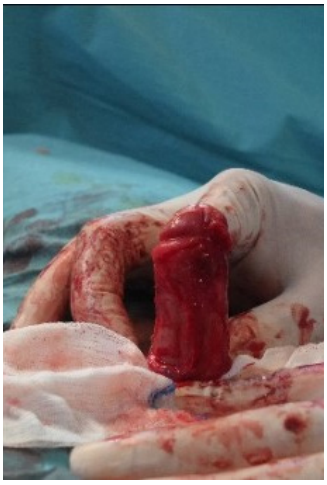
It was evaluated by physical examination and erection observation by the patient and/or parent at follow-up after correction of the chordee.

In the follow-ups, chordee was completely re-

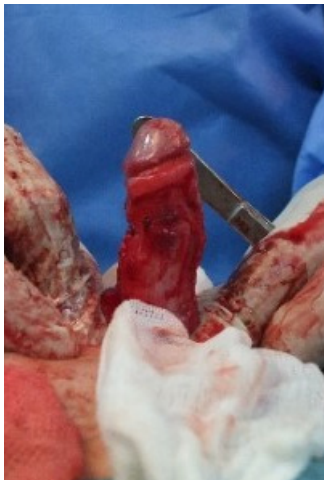
covered in all other patients who had ventral ten degree chordee in one patient who underwent corporotomy.

Picture 4,5: Post-operative pictures

Picture 4

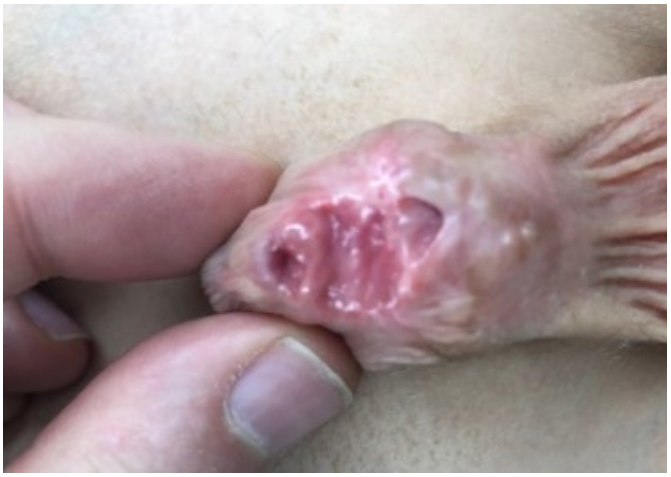


Picture 5



Picture 6,7: Post-operative pictures of the patient who underwent corporotomy and ventral grafting

Picture 6



Picture 7

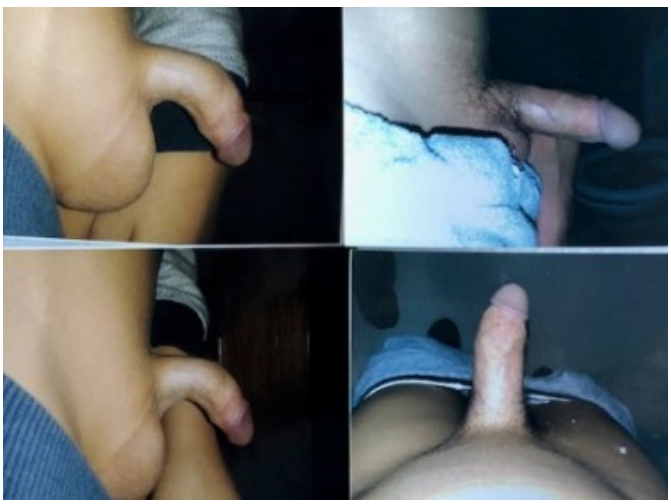


TABLE 1: Type, direction and surgical method of chordee

Patient number Age (Month)	Age (Month)	Direction of chordee	Degree	Type of chordee	Surgical method	Post -op chordee degree
Patient 1	85	Right dorsal	40	2	Heineke- Mikulicz	0
Patient 2	110	Right dorsal	60	4	Heineke- Mikulicz	0
Patient 3	120	Right lateral	30	3	Tunical plication	0
4. Patient	23	Right lateral	60	Skin cordee	Deglove	0
5. Patient	74	Left lateral	40	3	Tunical plication	0
6. Patient	84	Left lateral	30	Skin cordee	Deglove	0
7. Patient	43	Left lateral	80	4	Heineke- Mikulicz	0
8. Patient	40	Left lateral	45	4	Heineke- Mikulicz	0
9. Patient	60	ventral	30	Skin cordee	Deglove	0
10. Patient	112	ventral	30	Skin cordee	Deglove	0
11. Patient	133	ventral	90	5	Corporotomy	10
12. Patient	159	ventral	90	5	Corporotomy	0
13. Patient	32	ventral	35	Skin cordee	Deglove	0
14. Patient	112	ventral	30	Skin cordee	Deglove	0
15. Patient	176	ventral	30	3	Heineke- Mikulicz	0
16.Patient	130	ventral	30	Skin cordee	Deglove	0
17. Patient	69	ventral	40	3	Tunical plication	0

Discussion

Due to the rarity of chordee without hypospadias, there is still no consensus among surgeons on its surgical treatment.

In 1937, Young suggested that the chordee without hypospadias was connected to the congenitally short urethra.[4]

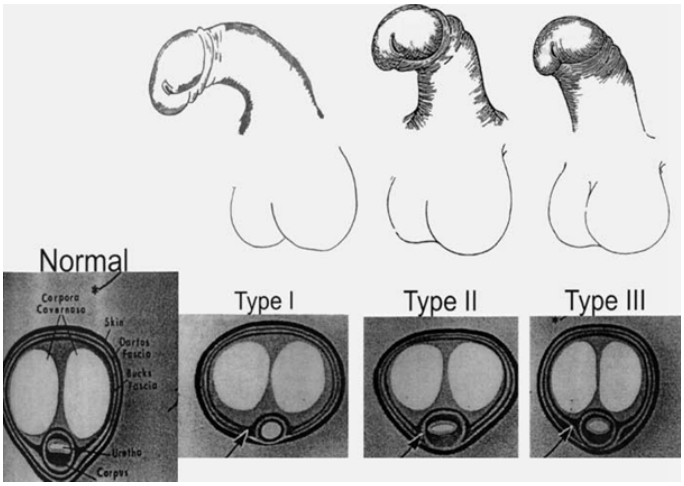
Devine and Horton divided chordees without hypospadias into three:[5]

In type 1, there is deficiency in the corpus spongiosum, buck fascia and dartos fascia in the chordee region.

In type 2, the corpus spongiosum is normal, there is dysgenesis in dartos and buck's fascia.

In type 3, the corpus spongiosum and buck's fascia are lacking in the normal dartos fascia.

Figure 1. Devine and Horton classification of chordee without hypospadias



Kramer et al. added type 4, which is caused by disproportion in the corpus cavernosum, and type 5, which is called congenital short urethra.[6-10] Surgical treatment gives successful results in cases of chordee without hypospadias, and in most of them,

the curvature can be corrected with a single operation.

It has been reported in the literature that 36-39% of patients have skin cordial.[11] In our series, 41% of them were found to have skin cord and this was compatible with the literature.

Most of the cases are ventral, but it can also be lateral and rarely dorsal.[12] In our series, 9 patients had ventral, 2 patients had dorsal and 6 patients had lateral chordee.

The first plication technique for the treatment of curvature was described by Nesbit in 1965. In the Nesbit technique, transverse elliptical excisions are made from the tunica. Elliptical excisions are sutured and closed transversely.[13] The Nesbit technique was modified by Kelami. In the Kelami technique, the tunica tissue to be removed is held with an allis clamp beforehand, its location is determined, and it is excised under the clamp.[14] In the Heineke-Mikulicz method, the incisions in the longitudinal tunica are cut and the transverse is closed with the alis clamp.[15] In 1985, Essed and Schroder described the tunical plication technique without tissue excision or incision.[16] In patients with severe penile curvature, the short side should be lengthened by grafting. Many grafts, including autologous, allograft and synthetic, and many surgical methods have been defined as grafts.

In the study of Polat et al., 16 (53%) of 30 patients with penile chord without prepubertal hypospadias improved with penile degloving. In our series, 1 of 17 patients was postpubertal, and 7 (43%) of the remaining 16 patients were found to be resolved with penile degloving. In the study of Polat et al., 3 of 30 patients (10%) underwent graft. In our series, 2 of 16 postpubertal patients (12%) underwent corpoprotomy and grafting is similar as literature.[11] Our results were found to be compatible with the literature.

A better understanding of penile neurovascular anatomy has led to improved surgical techniques and treatment outcomes. Various surgical techniques have evolved; however, none are without complications and long-term follow-up studies are lacking.

The vast majority of penile cords without hypospadias can be corrected with simple degloving or plication techniques. No matter what technique we use, the protection of neurovascular structures and the urethral plate should be our main goal. Although penile cordis without hypospadias is rare, we argue that it can be performed in experienced centers with low complication rates and successful results.

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RESEARCH ARTICLE

Evaluation of thorax computed tomography findings of patients with COVID-19 associated myocarditis

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Abstract

Introductıon: It is known that human coronaviruses cause myocarditis, and during the pandemic, a series of coronavirus disease (COVID-19) related myocarditis cases have been reported. It is stated that cardiac magnetic resonance (CMR) has a specificity of up to 91% and a sensitivity of 67% for the diagnosis of myocarditis. The present study aims to determine whether patients at risk for myocarditis might be recognized on thoracic CT, comparing thoracic computed tomography (CT) and laboratory findings of patients with COVID-19-associated myocarditis that can be a significant consequence for COVID-19 patients and controls. **Methods:** The study included 51 patients with elevated troponin levels, CMR, and suspected myocarditis to meet this aim. As a result of the evaluation, while myocarditis findings such as a signal change in myocardial contrast involvement on T1 and T2 weighted images and contrast involvement in myocarditis in post-contrast series were detected in 31 patients, no abnormality was detected in the CMRs of 20 patients **Results:** When the thoracic CT findings of the groups were compared, no significant difference was detected in the volumetric evaluations of infiltration frequency, distribution, lateralization, lobar involvement, and lung involvement. No infiltration related to COVID-19 was observed in most of the patients in both groups. Pleural and pericardial effusion were more frequently observed in the group with myocarditis. **Conclusion:** The present study revealed that myocardial involvement can occur without COVID-19-related distinct lung involvement and that pleural-pericardial effusion can be an alert for myocarditis diagnosis.

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Introduction

The virus, named SARS-CoV-2 by the World Health Organization, emerged in China's Wuhan city, spread to the whole world and infected millions of people in a brief time after its emergence in December 2019.[1] The infection named Coronavirus Disease 2019 (COVID-19) can progress asymptomatic or with mild symptoms. However, approximately 20% of the cases can have severe symptoms requiring hospitalization.[2]

Thoracic Computed Tomography (CT) is the most susceptible radiological method used for the evaluation of lung involvement in COVID-19 patients. In CT, there is a ground-glass appearance compatible with viral pneumonia, whether accompanied by consolidation. CT findings are usually bilaterally or peripherally distributed and include the lower lobes.[3]

Myocarditis is an inflammatory heart disease characterized by inflammatory infiltrations and myocardial damage without ischemic reasons. It is known for a long time that human coronaviruses cause myocarditis. During the pandemic, a series of COVID-19-related myocarditis cases were reported.[3]

The clinical manifestation of SARS-CoV-2 myocarditis varies between cases. While some patients can admit to the hospital with relatively mild symptoms such as fatigue and shortness of breath, some patients describe chest pain on exertion and chest tightness.[4,5] The American Heart Association (AHA) recommends performing tests with further cardiac imaging such as echocardiography or cardiovascular magnetic resonance (CMR) on patients with symptoms consistent with myocarditis.[6]

In this study, we aim to obtain data that can establish the possible connection between the CT and laboratory findings of patients with COVID-19-associated myocarditis, which can have fatal effects and cause serious problems for COVID-19 patients and the control group, and myocarditis. We wanted to examine which CT findings are common in patients with myocarditis, and whether there is a relationship between involved lung volume and myocarditis or not. In addition, we intended to use laboratory data to support CT findings. In conclusion, we aimed to determine whether thoracic CT findings could be used to detect patients at risk for COVID-19-related myocarditis.

Material and Methods

The study was conducted as an observational and retrospective study. Ethical committee approval (Ankara City Hospital Clinical Research Committee No. 2 Decision dated June 2, 2021, numbered E2-21-526) and the Republic of Türkiye Ministry of Health's permission were obtained. The study included 51 patients over 18 years of age who had or were having COVID-19 infection and applied to our hospital with complaints such as chest pain, shortness of breath, and palpitation between April 1, 2020, and June 30, 2021 and had high troponin values that raised myocarditis suspicions and whose CMR examination were conducted. Lake Lous criteria, updated in 2018, were used to diagnose myocarditis.[7] As a result of CMR, 31 patients with myocarditis findings such as myocardial signal changes on T1A and T2A images and myocardial contrast involvement in post-contrast series and 20 patients without any pathological CMR findings were divided into two groups: the myocarditis group and the normal group.

Thoracic CT scanning is standard for all patients and obtained with a multi sectional GE 128 Revolution Evo model (GE Healthcare, US, 2018) in the supine position and inspiration phase. Scanning parameters are 100 kV tube voltage, 50-399 mAs, and a section thickness of 1.3mm

Patients' CMR were performed with a GE 1.5 Tesla Signa Explorer model (GE Healthcare, USA, 2018) MRI device, and they consist of cine sequences, morphological sequences, flow sequences, perfusion, and late contrast sequences.

The groups' thoracic CT were compared in terms of COVID-19 findings. The distribution of lesions (especially ground glass opacities (GGO), crazy-paving pattern (CPP), and consolidation areas which are often encountered in COVID-19 pneumonia (irregular peripheral nodular, confluent peripheral, peribronchovascular, perilobular, and peripheric linear irregular opacities), lobar involvement (upper lobe, middle lobe, lower lobe, middle and lower lobe, upper and lower lobes, and all lobes), and lateralization) were evaluated. In addition, peripheral irregular reticulation-atelectasia, pericardial-pleural effusion, and lymphadenopathy findings were recorded. In addition, lung volumes and involvement percentages were calculated. D-dimer (mg/L), CK-MB (µg/L), and troponin (ng/L) values were recorded from the groups' laboratory data.

In computed tomography, attenuation was measured with Hounsfield Unit (HU) and the density of water was accepted as 0 HU, while the den-

sity of air was accepted as -1000 HU. In several studies, the normally aerated lung parenchyma was measured at -900 and -500/-700 HU. In line with case studies and software suggestions, lung parenchyma aerated with -1024 and -705 HU was accepted as -705 and +5 consolidation and ground glass opacities. In the study, the affected lung volume was obtained with the measurements of unaerated and poorly aerated lung areas. Patients' thoracic CT images were uploaded to the AW Volume Share 7 workstation with Thoracic VCAR software for volume measurement. The software provides the affected percentage and volume according to the whole lung volume by calculating the unaerated and poorly aerated parenchyma areas through attenuation values.

First, the groups with and without myocarditis were demographically evaluated and compared. Then, thoracic CT findings in terms of COVID were evaluated separately for both groups and compared within themselves and between the groups. In addition, with the special Thoracic VCAR program, lung volumetric measurements (right lung volume, left lung volume, total lung volume, right lung involvement percentage, left lung involvement percentage, total lung involvement percentage, and total lung involvement volume) were conducted, and data were obtained for statistical analysis. Finally, the laboratory values of the patients were combined with other data and forwarded for statistical analysis.

In the evaluation of data, SPSS 25.0 (IBM Corp. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp) statistics package program was used. In the study, descriptive statistics for categorical and continuous variables (mean, standard deviation, median, number, and quantile) were given. And the homogeneity of the variances, which is among the preconditions of parametric tests, was checked with the "Levene" test. The "Shapiro-Wilk" test was used to check the normality assumption. When it was desired to evaluate the differences between the two groups, the "Student's t-Test" was used in the conditions where parametric test preconditions were met, and if not, the "Mann Whitney–U test" was used. The relationships between the categorical variables were analyzed using Fisher's Exact Test and Pearson's Chi-Square Test. $p<0,05$ and $p<0,01$ levels were considered statistically significant.

Results

Of the study participants, 19 were female and 32 were male. The mean age of the myocarditis group and the normal group were respectively 37.74±13,757 and 46,4±16,188. It was found that there was no statistically significant difference in terms of sex and age between the groups ($p>0,05$) (Table 1).

Table 1: Evaluation of Demographic Information

		Patients			p
		Myocarditis (n=31)	Normal (n=20)		
Gender	Female	10 (%32.3)	9 (%45)	0.844	0.358 [2]
	Male	21 (%67.7)	11 (%55)		
Age		37.74±13.757	46.4±16.188	-1.976	0.056 [1]
		41 (25;46)	45 (35;53)		

1: Independent sample t test (t); 2: Chi-Square Test ($\chi 2$)

When the thoracic CT findings of the study groups were examined (Table 2), while GGO was present in 25,8% of the myocarditis group, it was present in 55% of the normal group. There is a statistically significant difference between the groups in terms of GGO prevalence ($\chi 2=4,432$ $p=0,035$).

While pleural effusion was observed in 12,9% of the myocarditis group, effusion was not observed in any patient in the normal group. There is a statistically significant relationship between the groups in terms of pleural effusion prevalence ($\chi 2=4,200$ $p=0,040$).

Between the groups, no statistically significant relationship was found in terms of lobar involvement ($\chi 2=4,563$ $p=0,207$). While 63% bilateral and 38% unilateral parenchymal involvement were observed in the myocarditis group; the normal group demonstrated 91% bilateral and 9% unilateral involvement. No significant difference was found between the groups in terms of lateralizing involvement ($\chi 2=2,249$ $p=0,134$). No significant difference was observed between the groups in terms of lung volumes, involvement percentages, and mean values obtained from laboratory parameters ($p>0,05$) (Table III and IV).

Table II: Evaluation of Clinical Findings According to Study Groups

		Patients			p
		Myocarditis (n=31)	Normal (n=20)		
Ground glass opacity	no	23 (%74.2)	9 (%45)	4.432	0.035 [1]*
	yes	8 (%25.8)	11 (%55)		
Ground glass opacity and consolidation	no	26 (%83.9)	13 (%65)	2.406	0.121 [1]
	yes	5 (%16.1)	7 (%35)		
Peripheral nodular patern	no	26 (%83.9)	14 (%70)	1.383	0.240 [1]
	yes	5 (%16.1)	6 (%30)		
Peripheral confluen involvement	no	30 (%96.8)	17 (%85)	2.332	0.127 [1]
	yes	1 (%3.2)	3 (%15)		
Diffuse involvement	no	30 (%96.8)	20 (%100)	0.658	0.417 [1]
	yes	1 (%3.2)	0 (%0)		
Peribronchovascular nodular involvement	no	30 (%96.8)	18 (%90)	1.008	0.315 [1]
	yes	1 (%3.2)	2 (%10)		
Crazy paving pattern	no	30 (%96.8)	19 (%95)	0.102	0.750 [1]
	yes	1 (%3.2)	1 (%5)		
Irregular reticulations	no	31 (%100)	19 (%95)	1.581	0.209 [1]
	yes	0 (%0)	1 (%5)		
Pleural effusion	no	27 (%87.1)	20 (%100)	4.200	0.040 [1]*
	yes	4 (%12.9)	0 (%0)		
Pericardial effusion	no	29 (%93.5)	20 (%100)	2.044	0.153 [1]
	yes	2 (%6.5)	0 (%0)		
Lober involvement	Upper lobe	3 (%38)	1 (%9)	4.563	0.207[1]
	Lower lobe	1 (%13)	0 (%0)		
	All lobes	4 (%50)	9 (%82)		
	Upper and lower lobes	0 (%0)	1 (%9)		
Lateralisation	Bilateral	5 (%63)	10 (%91)	2.249	0.134 [1]
	Unilateral	3 (%38)	1 (%9)		

*p<0,05; [1]: Chi-Square Test ($\chi 2$)

Table III: Evaluation of Lung Volume and Percentage of Involvement in Thorax CT Examination by Study Groups

	Patients			p
	Myocarditis (n=31)	Normal (n=20)		
	(Mean+Sd)	(Mean+Sd)		
Left lung involvement(%)	5.06±11.73	9.51±17.648	-1.342	0.180 [2]
	0 (0;5.7)	0 (0;13)		
Left lung volume	2.18±0.757	1.96±0.713	0.907	0.370 [1]
	2.1 (1.7;2.75)	2 (1.4;2.7)		
Right lung involvement(%)	3.82±8.243	11.08±16.796	-1.883	0.060 [2]
	0 (0;5.85)	7.7 (0;16)		
Right lung volume	2.46±0.803	2.24±0.858	0.815	0.420 [1]
	2.45 (1.93;2.98)	2.3 (1.5;3.1)		
Total lung involvement(%)	4.27±9.352	10.2±16.954	-1.582	0.114 [2]
	0 (0;4.18)	6.8 (0;14)		
Total lung volume	4.68±1.553	4.22±1.55	0.907	0.370 [1]
	4.55 (3.65;5.65)	4.3 (2.8;5.7)		
Total lung involment volume	0.22±0.475	0.35±0.505	-1.335	0.182 [2]
	0 (0;0.25)	0.26 (0;0.47)		

[1]: Independent sample t test (t); [2]: Man Whitney U test (z)

Table IV: Evaluation of Laboratory Data by Study Groups

	Myocarditis (n=31)	Normal (n=20)		p.
	(Mean+Sd)	(Mean+Sd)		
D-dimer (mg/L)	2.47±6.042	102.53±442.545	-0.288	0.773 [2]
	0.68 (0,27;1.73)	0.57 (0.24;2)		
CK-MB (µg/L)	6.71±20.753	12.7±35.201	-0.098	0.922 [2]
	1.23 (0.83;2.45)	1.44 (0.49;5.77)		
Troponin I (ng/L)	2017.26±5759.237	2302.52±6638.941	-0.111	0.911 [2]
	9 (2.5;510)	7 (3;17)		

[1]: Independent sample t test (t); [2]: Man Whitney U test (z)

Discussion

Thoracic CT findings of COVID-19 infection and involvement frequencies have been defined in detail as the pandemic has progressed. In 10.6% of the symptomatic patients, thoracic CT findings are normal within 4-5 days after the beginning of the symptoms. In the following days, this ratio decreases gradually (1.2-4%). CT findings are normal in approximately 46% of asymptomatic patients.[1, 8, 9, 10]

Ground glass opacities, vascular enlargement, bilateral involvement, lower lobe, and posterior lung are among the common thoracic CT findings and are observed in 70% of the cases. Consolidation, linear opacities, septal thickenings and reticulations, crazy-paving pattern, air bronchogram, pleural thickening, halo sign and reversed halo sign are less common findings and reported in the literature with a 10% to 70% prevalence. In addition, among less common findings, one-sided involvement (15%), single or focal lesion (10,5%), middle or upper lobe involvement (49%), and extensive involvement (26%) were reported. Pleural effusion, tree-in-bud appearance, lymphadenopathy, central lesion distribution and pericardial effusion are rare findings and detected in less than 10% of the cases.[8,11]

In the study conducted by Ashar Pirzada et al. using Louise criteria, it is stated that CMR has a specificity of up to 91% and a sensitivity of 67% for the diagnosis of myocarditis.[12] Another study reported that if no contraindications exist, CMR can be used as the primary diagnostic in COVID-19-related myocarditis examination.[13] With this information, CMR was accepted as the standard diagnostic tool.

Males predominated in both the CMR-detected myocarditis group and the normal group, accounting for 67.7% of the myocarditis group and 55% of the non-myocarditis group. The mean ages of the CMR-detected myocarditis group and non-myocarditis group were respectively 37,7±13 and 46,4±16. In the study of Sawalha et al., conducted on the cases published in the literature, the mean age of 14 myocarditis/myopericarditis cases was 50.4, and male dominancy was present (58%). Troponin levels were elevated in 91% of cases.[14,15] In a compilation by Kariyanna et al., the mean age of the COVID-19 patients with myocarditis was 51.8, the male/female ratio was equal and troponin levels were elevated in all patients.[16] In a compilation by Ho et al., the mean age was 55, and 69% of the cases were males. In addition, troponin levels were higher in most of the cases.[16,17] Male dominancy in the current study showed a similarity between the studies in the literature, and mean age was shown to be lower.

While late myocardial enhancement was detected in most of the patients (90.3%), accompanying pericardial enhancement was only detected in eight patients (25,8%) (Figure 1,2). In the series conducted by Esposito et al. on ten patients who underwent a CMR test for COVID-19-related myocarditis suspicion, generalized myocardial edema was demonstrated in all cases, but eight patients' late contrast images were found to be normal.[18] In the current study, late myocardial enhancement was detected in all patients.

Figure 1

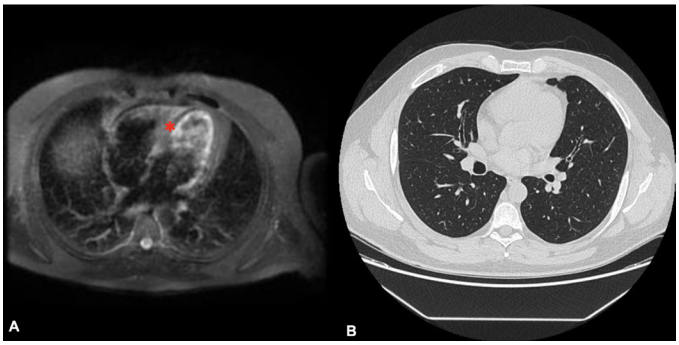

Figure 1. Cardiac magnetic resonance and thorax computed tomography examinations (CT) of the same patient. Myocardium showing contrast enhancement in the late contrast series on the left(asterix). Normal thorax CT on right

Figure 2

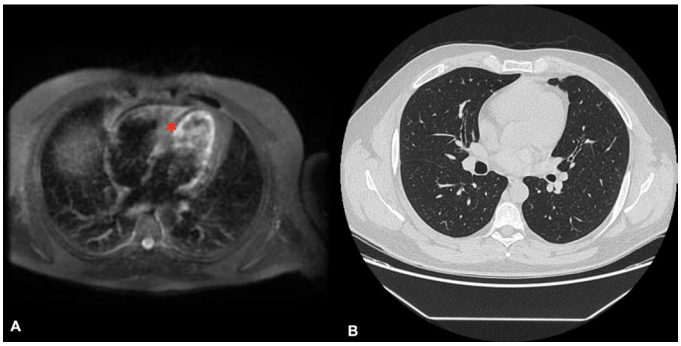

Figure 2. Cardiac magnetic resonance and thorax computed tomography examinations (CT) of the same patient. Subendocardial patchy contrast enhancement(asterix) is observed in the late contrast series on the left(A). Widespread involvement due to COVID-19 pneumonia on the right (B).

When the thoracic CT results of the patient group with myocarditis compatible CMR findings were examined, infiltration was not monitored in the majority of them (74.2%). Infiltration was present only in eight patients' lungs. All of these patients had infiltration ground-glass opacity-shaped regions, and five of them had accompanying consolidations. In addition, these patients' involvements are mostly bilateral (62.5%), involve all lobes, and show the distribution in a peripheral nodular pattern (62.5%), compatible with the literature. Pleural effusion was detected in four of the patients, and pericardial effusion in two patients. In the normal group, where pathology was not detected on CMR, infiltration was identified in 11 patients (55%) and not in nine patients (45%) on thoracic CT. Ground glass appearance was present in all patients with involvement. And in seven patients, accompanying consolidations were present. Most of the infiltrations consisted of opacities displaying bilateral distribution (90.9%), involving all lobes (81.8%), irregular peripheral weighted nodular (54.5%), and peripheral weighted confluent (27.7%). While the group without myocarditis displayed a pattern more consistent with the literature, findings which can be considered atypical were more common in the group with myocarditis. When both groups were compared, no statistical difference was found in thoracic CT findings. Interestingly, it was seen that in the group without myocarditis, thoracic infiltration was observed more, in a statistically detected ratio.

Pericardial and pleural effusions are only observed in the group with myocarditis and arise as a distinctive feature. When the lung volumes and involvement percentages were compared, no statistical difference was found between the groups. However, the lung involvement percentage in the group without myocarditis was higher. This indicates that there is no correlation between the percentage of lung parenchyma involvement and myocardial involvement.

No significant difference was found between the groups in terms of troponin I, CK-MB, and D-dimer levels, and all patients' troponin I levels were high. In 16 patients in the myocarditis group (51.6%) and 11 patients in the non-myocarditis group (55%), D-dimer levels were above 500 ng/mL.

COVID-19-related myocarditis and acute heart failure cases in patients who did not have COVID-19 pneumonia despite a positive PCR test or overcame COVID-19 reported in the literature indicate the possibility of late-onset cardiac complications and myocarditis, even in those with mild symptoms.[19-21] In the current study, infiltration was not monitored in thoracic CT tests in most of the cases in both the myocarditis and non-myocarditis groups. This case proves that even when COVID-19 pneumonia is not present, myocarditis may occur in PCR-positive patients, which is consistent with the literature.

In a study conducted on 26 patients, the majority of whom recovered from moderate COVID-19 pneumonia (85%), had no cardiovascular disease other than hypertension (8%) before and who applied for CMR, myocardial damage symptoms were present in 58% of the patients (n=15). Late gadolinium enhancement was detected in eight patients (31%) and myocardial edema in 14 patients (54%).[22] Several studies have shown that patients who recovered from COVID-19 and had no active cardiac symptoms had widespread myocardial damage in the early stages of their recovery period.[19, 23, 24]

In the early studies on COVID-19-related myocarditis, it was reported that acute heart damage is more commonly observed in patients with more severe COVID-19 infection, and patients who suffered heart damage were old individuals with comorbidities such as hypertension, CAH, and diabetes.[25] The findings cannot be confirmed in the current study. The patient group consists of younger patients and severe lung involvement due to COVID-19 is not observed. Based on this case, as mentioned in the studies above, even patients who did not have COVID-19 pneumonia or had a mild disease can develop COVID-19-related pneumonia.

Some of the study's limitations is that clinical findings such as shortness of breath and chest pain, as well as results such as echocardiography findings, elevated sPAP, and systolic dysfunction, were not compared between the patient and normal groups.

Conclucion

Myocarditis is an important complication of COVID-19 infection and has recently become a frequently discussed topic. Many studies have demonstrated that CMR is the best non-invasive diagnostic tool in the diagnosis of COVID-19-related myocarditis. The findings of our study reveal that myocardial involvement in CMR can occur without

prominent lung involvement. Therefore, we recommend that patients who have had COVID-19 infection but do not show obvious pneumonia signs and with cardiovascular findings or elevated troponin levels be evaluated with CMR in terms of myocarditis, and myocarditis retraction be performed. In addition, we observed that there was no linear relationship between the severity of lung involvement and myocardial involvement. While patients with severe lung involvement may not have myocarditis, a COVID-19 infection that has not caused parenchymal involvement can cause myocarditis. This situation indicates the possibility of other mechanisms or liability situations other than the common mechanisms regarding disease-related lung damage or myocardial damage. We believe that studies on this situation should continue. Pleural effusion and pericardial effusion have been demonstrated to frequently accompany myocarditis, and there may be warning symptoms in suspected patients when contemplating CMR imaging. As a result of our study, we also found that our myocarditis patient group was represented by a younger population compared to the literature. We discovered that complications such as myocarditis can occur post-COVID-19 infection, especially in young and healthy people. Therefore, we believe that, especially in the younger age group, in the case of clinical suspicion, the patients should be evaluated with CMR for myocarditis retraction. There are many studies in the literature on COVID-19 infection-related myocarditis. These studies focused on the relationship between myocarditis presence and COVID-19, myocardial damage occurrence mechanisms, and diagnosis with CMR. We attempted to present a new perspective by approaching the 51-patient case series in terms of CT findings. Thoracic CT is known to be performed on many COVID-19 patients for diagnosis or follow-up. CMR is a test that is not widely available and is requested rarely. Therefore, we focused on obtaining information regarding myocarditis by focusing on thoracic CT findings. fered heart damage were old individuals with comorbidities such as hypertension, CAH, and diabetes25. The findings cannot be confirmed in the current study. The patient group consists of younger patients and severe lung involvement due to COVID-19 is not observed. Based on this case, as mentioned in the studies above, even patients who did not have COVID-19 pneumonia or had a mild disease can develop COVID-19-related pneumonia. Some of the study's limitations is that clinical findings such as shortness of breath and chest pain, as well as results such as echocardiography findings, elevated sPAP, and systolic dysfunction, were not compared between the patient and normal groups.

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LETTER TO THE EDITOR

Chronic myelomonocytic leukemia complicated by telangiectasia and small bowel bleeding

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In the last few years, the incidence of telangiectasia and small bleeding complicated with chronic myelomonocytic leukemia (CMML) in patients treated for small bowel bleeding has been increasing, yet to the best of our knowledge, we describe this rare case of telangiectasia and small bowel bleeding with CMML.

Telangiectasia, also known as spider veins, is a disorder causing abnormal capillary diameter dilation, microvascular wall fragility, and increased blood drainage.[1] It has a low incidence but a high case fatality rate. Small bowel bleeding due to capillary dilation is a threatening condition with a high case fatality rate. Chronic mononucleosis (CMML) is a rare, variable disease primarily seen in elderly patients, characterized by leukemic dysplasia, hematopoiesis, and monocyte proliferation, with an average survival time of 12–18 months.

Case 1: A 76-year-old male experienced intermittent melena for 15 days, which worsened for 2 days. After a polypectomy, he complained of black stool for 2 days, followed by dizziness, fatigue, palpitation, and discomfort. He underwent blood transfusions, hemostasis, and other treatments. A colonoscopy revealed multiple ulcers in the small intestine and mucosal bulges[-Fig1]. Intraoperative surgical exploration revealed fine capillaries in the ileal intestinal wall. Partial ileal resection was performed, and the patient's white blood cells increased to 37 x 109/L, hemoglobin increased to 82 x 109/L, and platelets decreased to 99 x 109/L. the patient with CMML, diagnosed with a genetic mutation in the ASXL gene, had high white blood cell variability, high blood pressure, and a severe lung infection. He died one year after surgery but improved after iron polysaccharide and thalidomide treatment.

The patient with a small bowel bleeding disorder (SBB) showed increased blood levels after hospital discharge. Treatments included blood transfusions, fluid replacement, acid suppression, and hemostasis. However, telangiectasia persisted. Despite advances, some patients remain undetected due to a lack of symptoms. The patient refused a bone marrow aspiration which was confirmed through genetic testing.

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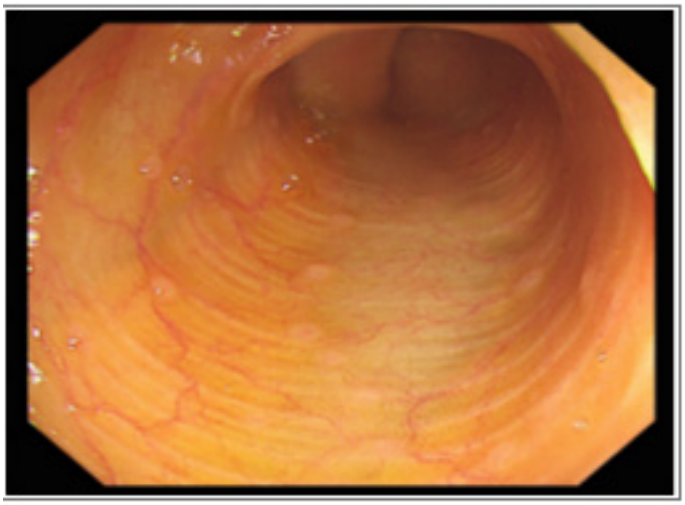
Gene mutations in TET2, SRSF2, and ASXL1 are significant diagnostic and prognostic factors in CMML patients. Clinical manifestations are insidious, and laboratory features are ambiguous, making them easy to miss and misdiagnose. In one patient, a delay in diagnosis may be due to a misinterpretation of leukocytosis due to bone marrow compensatory capacity or temporary narrowing of the spleen. The patient's mucosal injury may cause small bowel bleeding due to white blood cell infiltration into the vascular wall.[2]

Small bowel bleeding with CMML has low mortality rates, but physicians should differentiate it from other hematological diseases to avoid confusion and misdiagnosis, especially when dealing with difficult-to-control hematomas or anemias.

Figure 1: Shows intraoperative colonoscopy (International Documentation)



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