Section: Pathology

Original Research Article

UNORTHODOX INTRA ABDOMINAL OCCURRENCE OF PRIMARY SQUAMOUS CELL CARCINOMA – A REPORT OF 6 INTERESTING LOCATIONS

Juturu Akhila[1], Lalitha Shree M[2], V. Thejaswini[3], Galeti Ayesha[4], Madhuri R[5], Kharidehal Durga[6]

[1]*Post Graduate, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*
[2]*Assistant Professor, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*
[3]*Assistant Professor, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*
[4]*Assistant Professor, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*
[5]*Assistant Professor, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*
[6]*Professor and HOD, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.*

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Corresponding Author:
Dr. Kharidehal Durga,
Professor and HOD, Department of Pathology, Narayana Medical College, Nellore, Andhra Pradesh, India.
Email: drkdurga.path@ gmail.com

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ABSTRACT

Background: Primary squamous cell carcinoma (SCC) arising in intra-abdominal organs is exceedingly rare and often presents a diagnostic challenge due to its overlap with metastatic disease. Most intra-abdominal structures are lined by glandular or transitional epithelium, making the squamous phenotype an unexpected and poorly understood occurrence. **Objective:** To present and analyze six rare cases of primary intra-abdominal SCC, highlighting their clinical presentations, pathological features, and potential etiopathogenetic mechanisms.

Materials and Methods: This retrospective case series was conducted over a three-year period (2021–2024). Six patients with histopathologically confirmed primary SCC located in the stomach, small intestine, renal pelvis, endometrium, ovary, and testis were included. Tissue specimens were examined after formalin fixation and hematoxylin and eosin (H&E) staining. Site-specific diagnostic criteria were applied to confirm the primary nature of the tumors.

Results: All six cases demonstrated well-differentiated SCC with evidence of local invasion. The gastric and small intestinal cases showed mucosal origin, ruling out metastatic lesions. Renal SCC was associated with nephrolithiasis and hydronephrosis. The endometrial case satisfied Fluhmann's criteria for primary origin. Gonadal tumors were consistent with malignant transformation of mature teratomas and epidermal cysts. Most patients presented at an advanced stage, and management was primarily surgical, with variable outcomes.

Conclusion: Primary SCC of intra-abdominal organs, though rare, should be considered in the differential diagnosis of unusual intra-abdominal masses. Rigorous clinicopathological correlation is essential to distinguish primary tumors from metastatic disease. Due to the lack of standardized treatment protocols, individualized management and further multicentric studies are warranted to improve understanding and outcomes.

Keywords: Intra Abdominal, Primary Squamous Cell Carcinoma, Cancer.

INTRODUCTION

Squamous cell carcinoma (SCC) is a malignant epithelial tumor arising from keratinocytes of the stratum spinosum. It is commonly seen in the skin, esophagus, cervix, and upper respiratory tract. In contrast, primary SCC involving intra-abdominal organs is extremely rare, largely due to the absence of native squamous epithelium in most visceral structures.[1,2] As a result, such cases are frequently mistaken for metastatic disease originating from more typical squamous primary sites, such as the cervix, lungs, or head and neck.

The gastrointestinal and genitourinary tracts are primarily lined by glandular or transitional epithelium, making the occurrence of squamous histology in these regions pathologically unusual.

Several hypotheses have been proposed to explain the development of SCC in these sites, including malignant transformation of heterotopic squamous epithelium, squamous metaplasia following chronic irritation or inflammation, aberrant differentiation of pleuripotent stem cells, and oncogenic viral infections such as human papillomavirus (HPV) or Epstein–Barr virus (EBV).[1,3,4]

Primary SCC of the stomach is extremely uncommon, accounting for only 0.04% to 0.07% of all gastric cancers, with the first case reported by Rolleston and Trevor in 1905.[1,2] In the small intestine, primary SCC is even rarer, with the earliest known report by Adair and Trowell in 1981.[3] In the urinary system, SCC more frequently arises in the renal pelvis than in the parenchyma and is often associated with chronic nephrolithiasis and hydronephrosis.[5] Endometrial SCC, representing less than 5% of all endometrial malignancies, is defined by the absence of glandular differentiation and requires exclusion of a cervical origin according to Fluhmann's criteria.[4] Primary SCCs of the ovary and testis are also rare and are typically linked to malignant transformation of mature cystic teratomas and epidermal cysts, respectively.[6,7]

Due to their rarity and nonspecific clinical presentations, primary intra-abdominal SCCs are often diagnosed at an advanced stage, and no standardized treatment guidelines exist. In this case series, we present six patients with histopathologically confirmed primary SCC involving intra-abdominal organs, including the stomach, small intestine, renal pelvis, endometrium, ovary, and testis.

MATERIALS AND METHODS

Study Design and Setting

This was a retrospective case series conducted in the Department of Pathology at a tertiary care teaching hospital in India. The study included cases diagnosed between January 2021 and December 2024. Ethical approval for the study was obtained from the Institutional Ethics Committee, and patient confidentiality was maintained throughout.

Inclusion Criteria

Patients were included in the study based on the following criteria:

1. Histopathological diagnosis of primary squamous cell carcinoma (SCC) involving intra-abdominal organs.
2. Absence of a known or suspected primary SCC at an extra-abdominal site (e.g., cervix, esophagus, lungs, or skin) based on clinical, radiological, and pathological evaluation.
3. Adequate tissue sample available for microscopic confirmation and site-specific histological assessment.
4. Availability of clinical and operative details to support diagnosis.

Exclusion Criteria

Patients were excluded if

1. The intra-abdominal lesion was determined to be metastatic SCC from another known primary site.
2. Tissue was inadequate or poorly preserved for histopathological confirmation.
3. Clinical data were insufficient to rule out a secondary origin.

Sample Collection and Processing

Surgical specimens from six patients were received in the pathology department over the study period. All specimens were fixed in 10% neutral-buffered formalin for a minimum of 24 hours. Gross examination was followed by representative sampling. Tissue was processed routinely, embedded in paraffin, and sectioned at 3–4 microns thickness. Staining was performed using hematoxylin and eosin (H&E). Additional special stains or immunohistochemistry were not performed due to resource constraints.

Diagnostic Criteria

Diagnosis of primary SCC at each anatomical site was based on histopathological features and established criteria in the literature. For endometrial SCC, Fluhmann's criteria were used, which include:

1. Absence of co-existing endometrial adenocarcinoma.
2. No connection between the endometrial tumor and cervical squamous epithelium.
3. No co-existing primary SCC of the cervix.[4]

In the gastrointestinal and renal cases, primary origin was supported by microscopic evidence of tumor arising from the mucosal surface, absence of distant metastases, and no history of extra-abdominal primary SCC.

Data Collection and Analysis

Clinical data including age, presenting symptoms, imaging findings, intraoperative observations, and treatment details were collected from patient case records. Histopathological reports and slides were reviewed by two independent pathologists to confirm diagnosis and site of origin. The findings were compiled and analyzed descriptively due to the observational nature and small sample size of the study.

RESULTS

A total of six cases of histologically confirmed primary squamous cell carcinoma (SCC) involving intra-abdominal organs were identified during the study period between 2021 and 2024. The patients included three males and three females, with an age range of 39 to 72 years (mean age: 55.6 years). Clinical presentations were variable, depending on the organ involved, but most patients presented with nonspecific symptoms such as abdominal pain, distension, or organ-specific complaints (e.g., postmenopausal bleeding, hematuria, pelvic mass).

All specimens were processed and stained with hematoxylin and eosin (H&E). In all six cases, the tumors demonstrated well-differentiated squamous cell carcinoma with features such as intercellular bridges, keratin pearl formation, and variable stromal invasion. Diagnosis of primary origin was supported by mucosal origin of the tumor, absence of glandular components (ruling out adenosquamous carcinoma), and lack of evidence of other primary squamous malignancies on clinical and radiological evaluation.

Table 1: Summary of Case Findings

Case	Age/Sex	Site Involved	Clinical Presentation	Gross Pathology	Histopathology	Supporting Features for Primary Origin
1	65 / M	Stomach	Epigastric pain, weight loss	Tumor arising from gastric mucosa, involving muscularis, lymph node metastasis	Infiltrating squamous carcinoma with keratin pearls	No adenocarcinoma component, mucosal origin, no other primary SCC
2	58 / F	Small intestine	Abdominal pain, obstruction	Tumor deep in wall with limited mucosal involvement	SCC invading from mucosa into muscularis propria	No known primary, mucosal origin confirmed
3	62 / M	Renal pelvis	Flank pain, hematuria	Dilated renal pelvis with tumor and stones	Squamous carcinoma with areas of squamous metaplasia in transitional epithelium	Hydronephrosis and nephrolithiasis, absence of urothelial carcinoma
4	68 / F	Endometrium	Postmenopausal bleeding	Nodular tumor invading myometrium	In situ SCC and invasive squamous carcinoma	Fulfilled Fluhmann's criteria; no cervical involvement
5	39 / F	Ovary	Lower abdominal mass, dull pain	Solid-cystic ovarian mass with thickened wall	Well-differentiated SCC with adjacent mature teratomatous elements	Histological features consistent with malignant transformation of teratoma
6	72 / M	Testis	Painless scrotal swelling	Mass with cystic degeneration	SCC arising in epidermal cyst wall with invasive features	No cutaneous connection; no systemic disease

On clinical examination, impaired mental status was seen in 30 patients, and all these had moderate to severe grade of acute pancreatitis. Mean heart rate was 85.05±12.1 bpm, mean body temperature was 37.51±0.9 0C, and mean respiratory rate was 19.35±2.7 bpm. Similar means were seen in mild cases excepting the heart rate which was lesser in mild pancreatitis (79.20±9.7 bpm).

Table 2: Clinical evaluation

	Total study population (Mean±SD)	Only mild cases (Mean±SD)
Impaired Mental Status (N)	30	0
Heart Rate (Bpm)	85.05±12.1	79.20±9.7
Body Temperature (0C)	37.51±0.9	37.19±0.7
Respiratory Rate (Bpm)	19.35±2.7	19.30±3.0

All six patients were treated surgically. Four patients underwent radical excision (total gastrectomy, nephrectomy, hysterectomy, or oophorectomy), while two patients underwent segmental resections. Adjuvant therapy was planned for three patients based on disease stage and performance status, but long-term follow-up data were limited in this retrospective review.

There were no instances of early postoperative mortality. However, at the time of last available follow-up, two patients had developed recurrent disease (stomach and renal pelvis cases), while others remained under periodic surveillance.

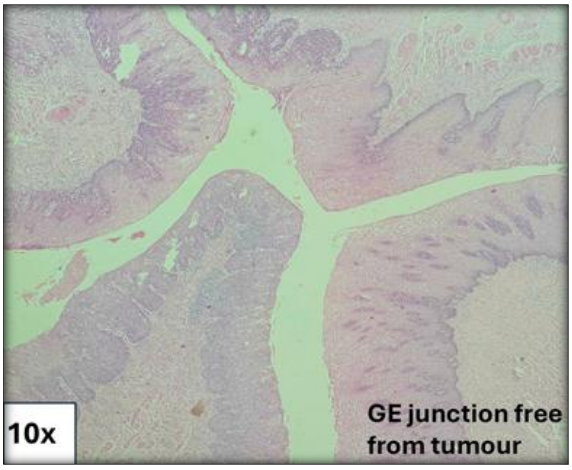

Figure 1: Squamous Cell Carinoma Stomach

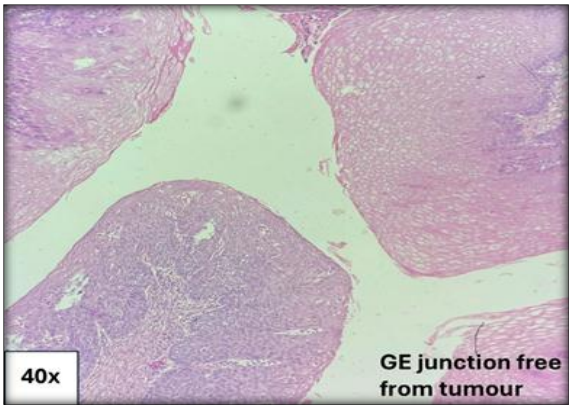

Figure 2: Squamous Cell Carinoma Stomach

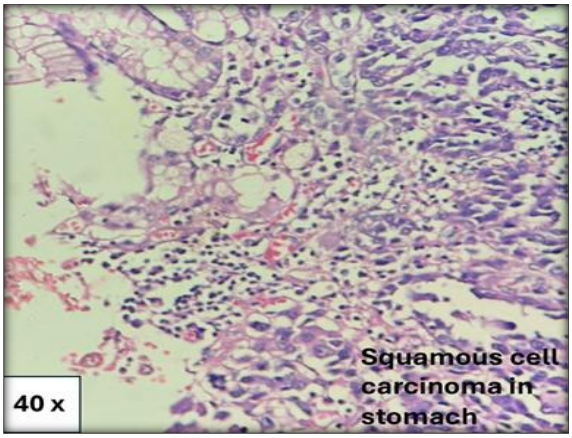

Figure 3: Squamous Cell Carinoma Stomach

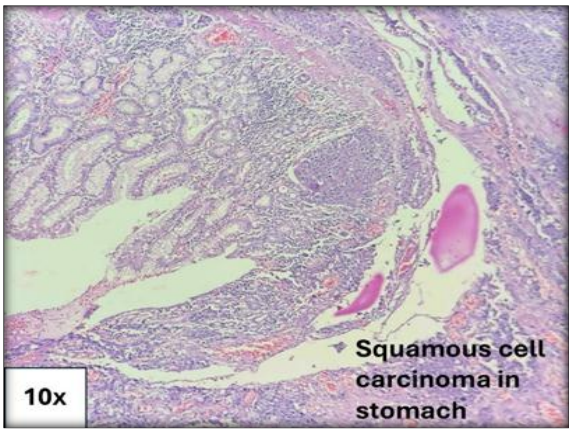

Figure 4: Squamous Cell Carinoma Stomach

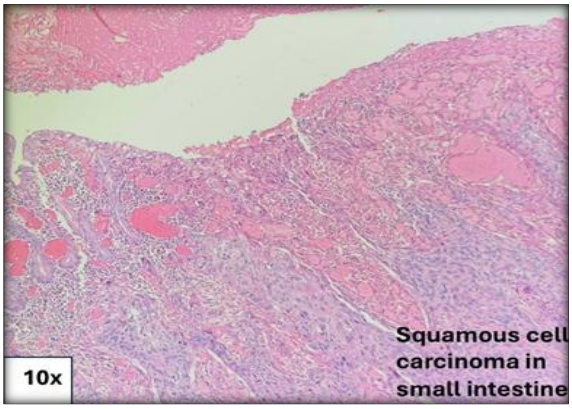

Figure 5: Squamous Cell Carinoma Small Intestine

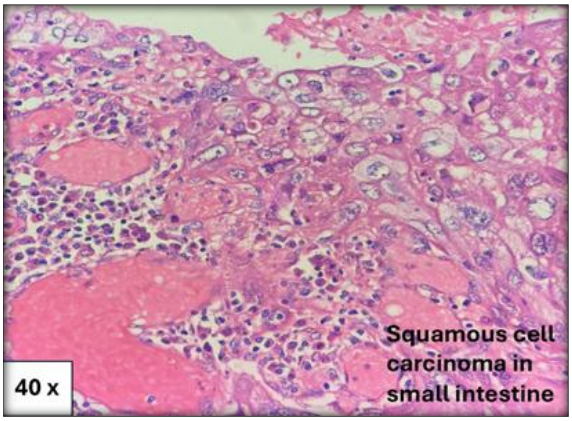

Figure 6: Squamous Cell Carinoma Small Intestine

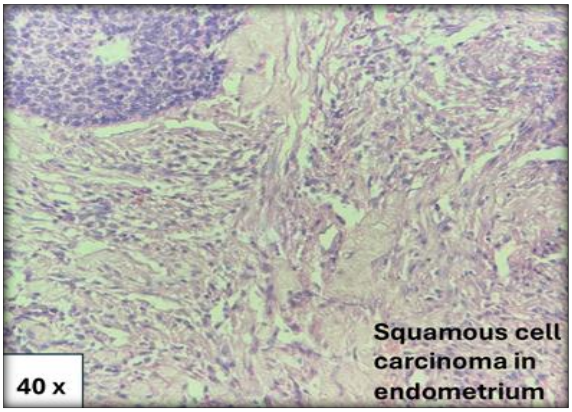

Figure 7: Squamous Cell Carinoma Endometrium

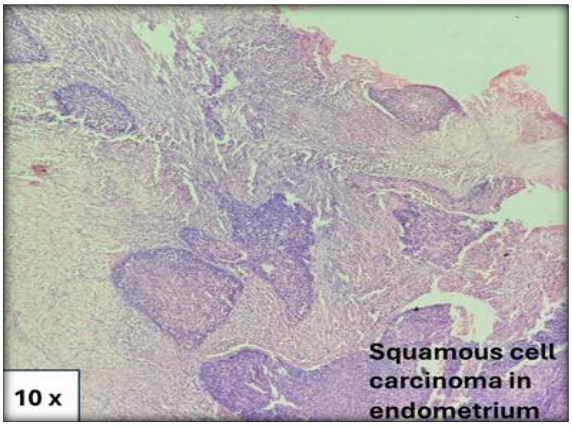

Figure 8: Squamous Cell Carinoma Endometrium

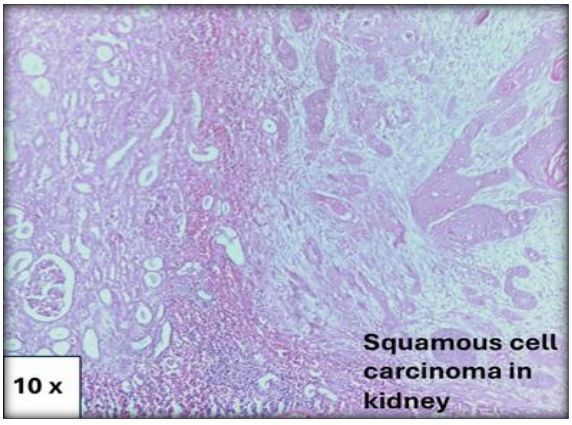

Figure 9: Squamous Cell Carinoma Kidney

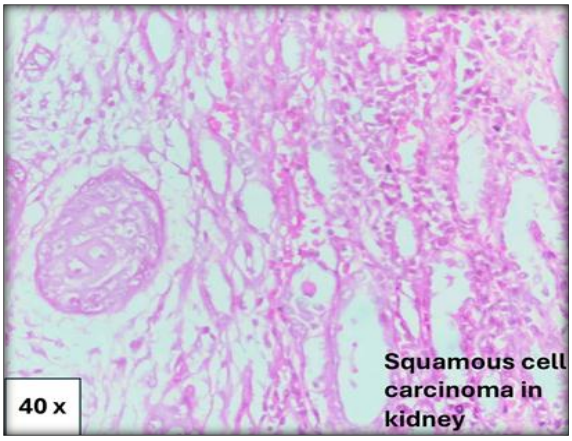

Figure 10: Squamous Cell Carinoma Kidney

DISCUSSION

Primary squamous cell carcinoma (SCC) in intra-abdominal organs is an uncommon malignancy, and its diagnosis requires careful exclusion of metastases from more frequent sites such as the cervix, esophagus, lung, or skin. Our case series of six histologically confirmed primary SCCs involving the stomach, small intestine, renal pelvis, endometrium, ovary, and testis adds to the limited literature on this rare disease spectrum.

González-Sánchez et al. reported that primary gastric SCC accounts for only 0.04–0.07% of all gastric cancers, with most lesions arising in the proximal third of the stomach and exhibiting aggressive clinical behaviour.[1] Our case demonstrated classical histologic features and nodal involvement. While surgery remains the mainstay of treatment, Cardoso et al. highlighted that some patients may respond favorably to platinum-based chemotherapy, although data are sparse due to the rarity of the condition.[2]

SCC of the small intestine is even more unusual. Mumtaz et al. presented a case involving mucosal origin in the ileum, noting the diagnostic challenge of distinguishing it from metastases.[3] Our case demonstrated mucosal involvement and absence of a primary elsewhere. Harned and Strum also emphasized that mucosal-based tumors without systemic disease suggest a primary origin, and Meckel's diverticulum should be considered as a possible source in some cases.[10]

Renal SCC accounts for less than 1% of renal neoplasms and typically arises from the renal pelvis. Zhang et al. described a case of SCC associated with chronic hydronephrosis, reinforcing the role of long-standing inflammation and urolithiasis in carcinogenesis.[5] Our case was consistent with this pattern and showed squamous metaplasia adjacent to the tumor. According to Holmäng et al., prognosis is poor and surgery remains the only effective treatment, with limited evidence supporting adjuvant therapies.[11]

Primary SCC of the endometrium is exceedingly rare. Li et al. described a case fulfilling Fluhmann's criteria, which require exclusion of coexisting endometrial adenocarcinoma, no continuity with cervical squamous epithelium, and no coexistent cervical SCC.[4] Our case conformed to all three. In a series by Shukla et al., combined surgical and adjuvant radiation therapy led to improved local control.[12]

In the ovary, SCC most often arises from malignant transformation of mature cystic teratomas. In a multicenter analysis, Chiang et al. found that SCC accounts for about 2% of such transformations, usually in postmenopausal women.[6] Our case demonstrated well-differentiated SCC arising within a mature teratoma. The authors advocated early surgical resection and carboplatin-paclitaxel chemotherapy in advanced or recurrent disease.

Primary testicular SCC is extremely rare and may originate from epidermal cysts or as part of teratomatous transformation. Kasahara et al. reported a similar case of SCC arising from an epidermal cyst wall without cutaneous connection.[7] Our case showed no evidence of metastasis or alternate origin. Shimbo et al. reviewed such cases and recommended surgical management, although standardized treatment protocols remain undefined due to extreme rarity.[13]

The shared theme across these sites is chronic irritation, metaplasia, or malignant transformation of pluripotent elements, such as teratomas. Although viral infections such as HPV and EBV are known to drive squamous carcinogenesis in mucosal tissues, their role in intra-abdominal SCC remains speculative. We were unable to assess viral involvement in our series due to limited resources.

Given the rarity of primary intra-abdominal SCCs, large-scale studies are lacking and management remains empirical. Surgical resection is the cornerstone of therapy, while chemotherapy or radiation may be considered in select cases. Most series, including those by Holmäng et al. and Chiang et al., report poor outcomes primarily due to delayed presentation and lack of early detection.[6,11]

CONCLUSION

Primary squamous cell carcinoma arising in intra-abdominal organs is an exceptionally rare and diagnostically challenging entity. Its occurrence in sites not normally lined by squamous epithelium demands careful exclusion of metastatic disease and reliance on strict clinicopathological criteria. In this case series, we presented six patients with confirmed primary SCC involving the stomach, small intestine, renal pelvis, endometrium, ovary, and testis. Common pathogenetic themes included chronic irritation, metaplastic changes, and malignant transformation of teratomatous tissue. While surgical resection remains the cornerstone of treatment, the role of chemotherapy or radiotherapy is evolving and should be individualized. Given the rarity of these tumors, further multi-institutional studies are

necessary to establish diagnostic guidelines and standardize treatment protocols.

Acknowledgments

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Conflicts of Interest

The authors declare no conflicts of interest related to this study.

REFERENCES

1. González-Sánchez JA, Vitón R, Collantes E, Rodríguez-Montes JA. Primary squamous cell carcinoma of the stomach. Clin Med Insights Oncol. 2017;11:1179554916686076. PMID: 28469507.
2. Cardoso VS, Costa FC, Santos CM, Guerreiro JM, Ramos SF. Primary gastric squamous cell carcinoma: case report. J Surg Case Rep. 2024;2024(1):rjad736.
3. Mumtaz S, Ahmad Z, Fatima S, Qureshi A. Squamous cell carcinoma in the small intestine. BMJ Case Rep. 2011;2011:bcr0120113762. PMID: 22696720.
4. Li H, Ye J, Qi X, Wang X. Primary endometrial squamous cell carcinoma with endometrial atypical hyperplasia in elderly women: a case report. Gynecol Pelvic Med. 2022;5(0).
5. Zhang X, Zhang Y, Ge C, Zhang J, Liang P. Squamous cell carcinoma of the renal parenchyma presenting as hydronephrosis: a case report and review of the recent literature. BMC Urol. 2020;20(1):107. PMID: 32689976.
6. Chiang AJ, Chen MY, Weng CS, Lin H, Lu CH, Wang PH, et al. Malignant transformation of ovarian mature cystic teratoma into squamous cell carcinoma: a Taiwanese Gynecologic Oncology Group (TGOG) study. J Gynecol Oncol. 2017;28(5):e69. PMID: 28657230.
7. Kasahara R, Tajiri R, Kobayashi K, Yao M, Kitami K. Squamous cell carcinoma developing from a testicular epidermal cyst: a case report and literature review. Case Rep Urol. 2019;2019:9014301. PMID: 31019832.
8. Rolleston HD, Trevor WH. Primary squamous carcinoma of the stomach. Br Med J. 1905;1:595.
9. Adair FE, Trowell JE. Squamous carcinoma of the small intestine: report of a case. Arch Surg. 1981;116(9):1184–6.
10. Harned RK, Strum SB. Squamous cell carcinoma of the small intestine: a case report and literature review. Cancer. 1984;54(2):415–420. PMID: 6726882.
11. Holmäng S, Lele SM, Johansson SL. Squamous cell carcinoma of the renal pelvis and ureter: incidence, symptoms, treatment and outcome. J Urol. 2007;178(1):51–56. PMID: 17574048.
12. Shukla M, Singh A, Maheshwari A, Patel S, Kumar S, Bansal A. Primary squamous cell carcinoma of endometrium: report of three cases and review of literature. Arch Gynecol Obstet. 2014;289(1):205–208. PMID: 23700267.
13. Shimbo T, Ito K, Inoue Y, Okada M, Iwamoto T, Suzuki K. Squamous cell carcinoma of the testis: a case report and review of the literature. Int J Urol. 2006;13(6):847–849. PMID: 16771791.