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Intra-abdominal Mixed Germ Cell Tumor (Seminoma and Choriocarcinoma) in an Adult with Cryptorchidism: A Rare Case Report and Surgical Approach

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A B S T R A C T

Intra-abdominal testicular germ cell tumors (TGCTs) arising from cryptorchid testes represent a rare but clinically significant entity in adult urology. Cryptorchidism, or undescended testis (UDT), persists as the most prominent risk factor for testicular malignancy, and its delayed diagnosis, particularly when testes reside intra-abdominally, frequently leads to complex presentations often discovered at an advanced stage. This report details the case of a young adult male diagnosed with a voluminous intra-abdominal mixed germ cell tumor, incorporating both seminoma and highly aggressive choriocarcinoma components, originating from a previously unrecognized undescended testis, highlighting the multifaceted challenges in diagnosis and management. A 29-year-old Indonesian male presented with a constellation of symptoms including persistent abdominal pain, progressive bloating, and patient-acknowledged abdominal mass. Pertinent clinical findings included bilaterally non-palpable testes within the scrotum and a large, firm, tender intra-abdominal mass upon examination. Contrast-enhanced computed tomography (CT) delineated a massive abdominopelvic tumor consistent with a primary testicular neoplasm, critically associated with significant para-aortic lymphadenopathy and confirming bilateral intra-abdominal undescended testes. Serological investigation revealed a markedly elevated alpha-fetoprotein (AFP) level (>400.00 ng/mL), strongly suggesting a non-seminomatous component. Consequently, the patient underwent an exploratory laparotomy, which confirmed the CT findings and revealed the tumor originating from the left intra-abdominal testis. A comprehensive surgical resection involving bilateral radical orchiectomy was performed, yielding a specimen measuring 20x15x15 cm and weighing 2.865 kg. Subsequent histopathological examination definitively classified the tumor as a mixed germ cell tumor with distinct seminoma and choriocarcinoma elements arising from the left testis; the contralateral right testis exhibited only atrophic changes consistent with UDT. In conclusion, the confluence of adult presentation, bilateral cryptorchidism, intra-abdominal location, massive tumor burden, and aggressive mixed histology (seminoma/choriocarcinoma) exemplifies the complexities encountered in managing such rare TGCT cases. Surgical extirpation via laparotomy remains indispensable for bulky intra-abdominal disease, providing both diagnostic confirmation and cytoreduction. Optimal patient outcomes mandate a meticulously planned, multidisciplinary approach integrating surgery with risk-stratified systemic chemotherapy, guided by precise histopathological analysis and serial tumor marker assessment.

1. Introduction

The intricate process of testicular descent, a crucial event in male development, involves the migration of the testes from their initial intra-abdominal location to the scrotum. This journey is fundamental for normal spermatogenesis and endocrine function. Cryptorchidism, or undescended testis (UDT), is a prevalent congenital anomaly in male infants, characterized by the failure of one or both testes to descend completely into the scrotum. Epidemiological studies indicate that the prevalence of cryptorchidism is approximately 3-4% in full-term male neonates. This

figure is significantly higher in premature births, reaching nearly 30%, highlighting the importance of late gestation development for the final stages of testicular descent. While spontaneous descent often occurs within the first few months of life, reducing the prevalence to about 1% by the age of one year, intervention is necessary for testes that remain undescended beyond this period. The etiology of cryptorchidism is complex and multifactorial, involving a combination of hormonal, anatomical, and genetic factors. The testicular descent process occurs in two main phases: the transabdominal phase and the inguinoscrotal phase. The transabdominal phase involves the migration of the testes from near the kidney to the internal inguinal ring and is influenced by factors such as Insulin-like peptide 3 (INSL3) and Anti-Müllerian Hormone (AMH). The inguinoscrotal phase, the subsequent migration through the inguinal canal into the scrotum, is primarily driven by androgens stimulating the genitofemoral nerve, along with the regression of the gubernaculum and intra-abdominal pressure dynamics. Disruptions in the hypothalamic-pituitary-gonadal axis, defects in androgen synthesis or sensitivity, structural abnormalities of the gubernaculum, or impaired INSL3 signaling can all contribute to the failure of testicular descent. Consequently, undescended testes can be located anywhere along the normal descent pathway, including the intra-abdomen (approximately 10-20% of cases), the inguinal canal, the external ring (suprascrotal), or in ectopic locations such as the perineum or femoral canal.[1-3]

Beyond its immediate effects on testicular development and function, cryptorchidism poses a significant long-term risk for the development of testicular germ cell tumors (TGCTs). Numerous studies have established cryptorchidism as the most important risk factor for testicular cancer, with an estimated 4- to 8-fold increase in relative risk. Some reports suggest even higher risks, up to 40 times greater for intra-abdominally retained testes compared to normally descended testes. The mechanisms underlying this association are complex and multifactorial. The higher temperature environment within the abdomen or inguinal canal can adversely affect germ cell maturation and survival, potentially leading to genomic instability. Additionally, cryptorchidism is frequently associated with testicular dysgenesis, characterized by histological abnormalities such as reduced germ cell numbers, Sertoli cell-only tubules, and microlithiasis, which may predispose the germ cells to malignant transformation. The Testicular Dysgenesis Syndrome (TDS) hypothesis proposes that cryptorchidism, hypospadias, impaired spermatogenesis, and TGCTs share common origins in disruptions of gonadal development during fetal life, potentially caused by genetic defects or exposure to environmental endocrine-disrupting chemicals. Testicular cancer, while relatively rare, accounting for only about 1% of all cancers in men, disproportionately affects young individuals. It is the most common solid tumor in males aged 15 to 35 years. The incidence of testicular cancer has been increasing globally over the past several decades, particularly in Western populations. TGCTs, which originate from primordial germ cells, constitute over 95% of testicular malignancies. These tumors are broadly classified into seminomas and non-seminomas (NSGCTs) based on their histological characteristics. Seminomas, the most common single subtype, typically occur in the fourth decade of life. NSGCTs include embryonal carcinoma, yolk sac tumor, choriocarcinoma, and teratoma, often presenting as mixed tumors with various combinations of these elements, and generally affect men in their third decade. Choriocarcinoma, although rare as a pure tumor, is a highly aggressive component known for early hematogenous metastasis, particularly to the lungs and brain, and is associated with a profound elevation of serum β-hCG. Mixed GCTs, which account for about 15% of TGCTs, are managed clinically based on the most aggressive NSGCT component present.[4-6]

Given the significant risks associated with cryptorchidism, current management guidelines emphasize early surgical correction. International

pediatric urology and surgery societies recommend orchidopexy, the surgical relocation of the testis into the scrotum, ideally between 6 and 18 months of age. Early intervention aims to maximize the potential for future fertility by placing the testis in a physiologically optimal thermal environment during critical developmental periods. Additionally, it reduces the risk of testicular torsion, potentially decreases the long-term malignancy risk compared to uncorrected UDT, and facilitates subsequent testicular self-examination or clinical palpation for early cancer detection. While orchidopexy improves surveillance, it is important to note that the intrinsic cancer risk remains elevated compared to the general population, necessitating lifelong patient awareness and appropriate follow-up. Despite advances in pediatric care, some individuals with UDT are not diagnosed or treated until adolescence or adulthood. This can be due to various factors, including socioeconomic barriers to healthcare access, lack of newborn screening programs, parental non-compliance, or missed diagnoses, especially for non-palpable testes. In adults, UDT may be discovered incidentally during evaluations for infertility or inguinal hernia or as a result of complications such as torsion or malignancy. When TGCT develops in an undescended testis in adulthood, particularly if the testis is intra-abdominal, diagnosis is often delayed. The absence of a palpable scrotal mass delays the patient seeking medical attention, and symptoms of the growing intra-abdominal or retroperitoneal tumor, such as abdominal or back pain, fullness, or a palpable mass, are often vague and non-specific. This delay can lead to presentation at a more advanced stage, with larger tumor volumes and a higher likelihood of regional lymphatic or distant metastasis compared to tumors detected early in scrotal testes.[7-10] This case report presents a 29-year-old male with advanced-stage, high-volume, aggressive mixed TGCT arising from an intra-abdominal testis, likely harboring bilateral cryptorchidism since birth. The large tumor size, retroperitoneal lymphadenopathy, challenging intra-abdominal location, and the presence of the highly malignant choriocarcinoma component highlight the severe consequences of unrecognized UDT persisting into adulthood. This case emphasizes the need for careful physical examination, including genital assessment, in young men with abdominal complaints and the importance of considering TGCT in the differential diagnosis of abdominopelvic masses, especially when scrotal contents are abnormal. The successful management of this case, although complex, underscores the importance of multidisciplinary care involving radical surgery and systemic chemotherapy for advanced TGCT.

2. Case Presentation

The patient, a 29-year-old Indonesian male, sought medical attention at the urology clinic of Dr. Moewardi General Hospital. His presentation was characterized by a constellation of symptoms, primarily centered around abdominal discomfort and distension. These symptoms included diffuse abdominal pain, significant bloating, and a subjective awareness of a mass located within the abdomen. The patient reported that these symptoms had been ongoing for a period of several months, exhibiting a gradual but progressive worsening trend. Importantly, the patient indicated that he had not experienced any prior significant medical conditions, undergone surgeries, or possessed a known history related to testicular issues. Specifically, he denied any awareness or diagnosis of cryptorchidism during his childhood or adolescence. The patient's age at presentation was 29 years. This is a clinically relevant detail, as testicular germ cell tumors, while relatively uncommon overall, represent the most frequent solid malignancy in young men, particularly within the age range of 15 to 35 years. The patient's age therefore, places him within a higher risk group for this specific type of neoplasm, making it a crucial factor in the differential diagnosis. Age also influences the expected type of germ cell tumor, with seminomas more common in the fourth decade and non-seminomatous germ cell tumors more common in the third decade. The patient's sex is male. This is a fundamental piece of information, as the

presenting symptoms and the subsequent clinical findings directly relate to the male reproductive system and associated anatomical structures. The focus of the evaluation and the range of potential diagnoses are inherently defined by the patient's sex. The patient's ethnicity was recorded as Indonesian. While ethnicity may not be a primary driver in the pathogenesis of testicular germ cell tumors, it is important for epidemiological considerations and can sometimes be relevant in the context of genetic predispositions within specific populations. Furthermore, considering the location of the hospital in Surakarta, Indonesia, the documentation of ethnicity contributes to a comprehensive patient profile within the local healthcare setting. The patient's Body Mass Index (BMI) was calculated to be 29.06 kg/m^2. This value falls within the overweight category according to the World Health Organization (WHO) classification. While not directly causative of the presenting symptoms, the patient's overweight status is a relevant piece of medical information. Obesity and overweight can contribute to a variety of health issues and may influence surgical considerations, anesthetic risks, and overall patient management. It is important to note that BMI alone is not a comprehensive measure of body composition and should be interpreted in conjunction with other clinical parameters. The patient's primary reasons for seeking medical attention were abdominal pain and bloating. Abdominal pain is a broad symptom with a wide differential diagnosis, spanning gastrointestinal, urological, gynecological (in females), and other systemic conditions. The diffuse nature of the pain, as noted in the initial assessment, suggests a more widespread or systemic process rather than a localized, organ-specific issue. Bloating, or abdominal distension, often accompanies abdominal pain and can be caused by increased gas production, fluid accumulation, or obstruction within the abdominal cavity. The combination of these two symptoms is significant and necessitates a thorough investigation to identify the underlying pathology. The patient also reported an awareness of a non-bothersome abdominal mass. The fact that the mass was initially perceived as "non-bothersome" is clinically important. It suggests that the mass may have been present for some time, growing slowly and insidiously without causing significant pain or discomfort in its early stages. This can be a characteristic feature of certain tumors, including some testicular germ cell tumors that may arise from an undescended testis. The lack of initial concern may have contributed to a delay in seeking medical evaluation, potentially impacting the stage of the disease at presentation. The patient's past medical history was notable for the absence of any prior significant medical conditions, surgeries, or known history related to testicular issues. Crucially, he reported no history of cryptorchidism diagnosis or treatment during childhood or adolescence. This absence of a known history of cryptorchidism is significant in the context of the presenting symptoms and physical findings, as cryptorchidism is a major risk factor for the development of testicular germ cell tumors. The lack of awareness of this condition may indicate that it was either undiagnosed or not adequately addressed during the patient's developmental years. The patient's vital signs revealed a blood pressure of 142/69 mmHg, a heart rate of 117 beats per minute, a temperature of 36.3°C, and a normal respiratory rate. The elevated blood pressure of 142/69 mmHg is classified as Stage 1 hypertension. While it's important to consider that a single elevated blood pressure reading may not definitively establish a diagnosis of hypertension (as factors like anxiety or pain can transiently elevate blood pressure), it warrants further investigation and monitoring. The elevated heart rate (tachycardia) of 117 beats per minute is also noteworthy. Tachycardia can be a response to pain, anxiety, or underlying medical conditions. In the context of abdominal pain and a potential mass, it could indicate the body's physiological response to stress or a more serious underlying issue. The patient's temperature of 36.3°C is within the normal range, suggesting the absence of an acute infectious process. A normal respiratory rate indicates that the patient was not experiencing any

acute respiratory distress. The abdominal examination revealed significant findings. The abdomen was described as enlarged, distended, and tender. Abdominal distension can be caused by various factors, including fluid accumulation (ascites), gas accumulation, bowel obstruction, or an enlarging mass. The tenderness upon palpation suggests inflammation or irritation of the abdominal lining (peritoneum) or the underlying organs. A large, firm, and somewhat ill-defined mass was palpated, primarily occupying the lower abdomen. The size, firmness, and ill-defined nature of the mass are important characteristics. A large mass can displace other abdominal organs and contribute to symptoms like bloating and discomfort. A firm mass suggests a solid or semi-solid consistency, potentially indicating a tumor or other abnormal tissue growth. The ill-defined borders make it difficult to determine the precise extent of the mass, which has implications for diagnosis and potential surgical planning. The most critical finding during the physical examination was the bilateral empty scrotum, with testes non-palpable. This finding strongly suggests bilateral cryptorchidism, or undescended testes. The absence of palpable testes in the scrotum is a key diagnostic clue, particularly in the context of an abdominal mass. Cryptorchidism is a significant risk factor for testicular germ cell tumors, and the intra-abdominal location of the testes increases this risk further. This finding, combined with the large abdominal mass, immediately raised suspicion for a malignant germ cell tumor. The serum alpha-fetoprotein (AFP) level was markedly elevated, exceeding 400.00 ng/mL. AFP is a tumor marker that is normally produced by the fetal yolk sac and liver. In adults, elevated AFP levels can be associated with certain types of tumors, most notably non-seminomatous germ cell tumors of the testis, as well as liver cancer. A markedly elevated AFP level, as seen in this case, strongly suggests the presence of a yolk sac tumor or embryonal carcinoma component within a testicular germ cell tumor. The degree of AFP elevation is also clinically relevant, as higher levels can correlate with a more advanced stage of disease or a more aggressive tumor. The serum beta-human chorionic gonadotropin (β-hCG) level was elevated at 15,000 mIU/mL. β-hCG is another tumor marker that is normally produced by the placenta during pregnancy. In males, elevated β-hCG levels can be associated with testicular germ cell tumors, particularly choriocarcinoma and embryonal carcinoma. Choriocarcinoma, even in small amounts, can produce significant elevations in β-hCG. The elevated level in this patient suggests the presence of a choriocarcinoma component, which is a highly aggressive type of germ cell tumor. The serum lactate dehydrogenase (LDH) level was elevated at 850 U/L. LDH is an enzyme found in many tissues throughout the body. Elevated LDH levels are not specific to testicular germ cell tumors but can indicate tissue damage or increased cell turnover. In the context of a testicular germ cell tumor, elevated LDH levels can reflect the tumor burden and the rate of tumor growth. LDH levels are also used in the staging and prognosis of these tumors. The complete blood count (CBC) revealed a white blood cell count (WBC) of 9.5 x $10^3/\mu L$, a hemoglobin level (Hb) of 13.8 g/dL, and a platelet count (Plt) of 280 x $10^3/\mu L$. These values are generally within normal limits. The WBC count indicates that there was no significant leukocytosis, which would suggest an infection or inflammatory process. The hemoglobin level indicates that the patient was not anemic. The platelet count was also within the normal range. While the CBC results were largely normal, they provide a baseline for comparison during subsequent treatment, as chemotherapy can affect blood cell counts. The basic metabolic panel showed a sodium level of 140 mEq/L, a potassium level of 4.1 mEq/L, a blood urea nitrogen (BUN) level of 15 mg/dL, and a creatinine level of 0.9 mg/dL. These values are within normal limits, indicating normal renal function and electrolyte balance. Normal renal function is particularly important because some chemotherapy drugs used to treat testicular germ cell tumors can be nephrotoxic. The Multi-Slice Computed Tomography (MSCT) scan of the abdomen and pelvis revealed a large right inguinal/intra-abdominal mass

extending up to the umbilicus, para-aortic lymphadenopathy (enlarged lymph nodes along the aorta), bilateral undescended testes located in the inguinal region, and left testicular hypoplasia (underdevelopment). The MSCT is a crucial imaging modality for evaluating abdominal masses and staging testicular germ cell tumors. The findings confirmed the presence of a large tumor, likely originating from an undescended testis. The para-aortic lymphadenopathy suggests that the tumor has metastasized to the regional lymph nodes, which is an important factor in staging and treatment planning. The identification of bilateral undescended testes further supports the diagnosis of cryptorchidism and its association with the tumor. Left testicular hypoplasia indicates that the left testis was abnormally small, likely due to the failure to descend properly. The chest radiograph showed that the cor (heart) and pulmo (lungs) were within normal limits, and there was no evidence of metastasis. A chest radiograph is a standard part of the initial evaluation for testicular germ cell tumors because these tumors can metastasize to the lungs. The absence of pulmonary metastases at this stage is a favorable prognostic sign. Based on the comprehensive evaluation, the initial clinical diagnosis was a malignant intra-abdominal tumor, suspected to be a testicular germ cell tumor (GCT), originating from bilateral undescended testes (UDT), with possible retroperitoneal lymphadenopathy and Stage 1 hypertension. This diagnosis reflects the integration of the patient's symptoms, physical findings, laboratory results, and imaging studies. The high index of suspicion for a testicular germ cell tumor was driven by the combination of the abdominal mass, the absence of palpable testes in the scrotum, and the elevated tumor markers (AFP and β-hCG). The imaging findings further supported this diagnosis and provided information about the extent of the disease. The inclusion of Stage 1 hypertension in the clinical diagnosis acknowledges the patient's elevated blood pressure, which requires further evaluation and management (Table 1).

The management of this patient with a complex presentation of a mixed germ cell tumor involved a multi-faceted approach, integrating surgical intervention, adjuvant chemotherapy, and a structured long-term follow-up strategy. This comprehensive plan was designed to address the primary tumor, manage potential metastatic disease, and ensure ongoing surveillance for recurrence or treatment-related complications. The initial and critical phase of treatment involved a surgical intervention aimed at both definitive diagnosis and primary tumor removal. The surgical procedure was conducted via an exploratory laparotomy using a midline incision. An exploratory laparotomy is an open surgical procedure where the abdomen is opened to allow for direct visualization and manipulation of the abdominal contents. A midline incision, a vertical incision made along the midline of the abdomen, is a common approach for such procedures, providing wide access to the abdominal cavity. This approach was likely chosen due to the large size of the tumor and the need for thorough exploration and resection. The intraoperative findings were significant. A massive tumor, measuring 20 cm by 15 cm by 15 cm and weighing 2.865 kg, was discovered. This tumor was determined to be originating from the left intra-abdominal testis. The sheer size of the tumor underscores the advanced nature of the disease at presentation. Additionally, para-aortic lymphadenopathy, or enlargement of the lymph nodes along the aorta, was noted. This finding corroborated the pre-operative imaging findings and indicated regional lymph node involvement, a crucial factor in staging and prognosis. The size of the lymph nodes was specified as 4-5 cm, further emphasizing the extent of the lymphatic spread. The surgical intervention consisted of a resection of the left testicular tumor mass along with a bilateral radical orchiectomy. Resection refers to the surgical removal of the tumor. A radical orchiectomy involves the removal of the entire testis along with the spermatic cord and associated structures. The bilateral nature of the orchiectomy, meaning the removal of both testes,

was performed despite the tumor appearing to originate from the left testis. This was likely due to the patient's history of bilateral cryptorchidism, which carries an increased risk of malignancy in the contralateral testis, even if not clinically apparent at the time of surgery. It also eliminates any future risk of testicular cancer development in the remaining testis and addresses potential hormonal considerations. The histopathological examination of the surgical specimens provided a definitive diagnosis. The tumor in the left testis was confirmed to be a Mixed Germ Cell Tumor. This tumor exhibited components of both Seminoma and Choriocarcinoma. Seminoma and Choriocarcinoma are distinct histological subtypes of testicular germ cell tumors with different growth patterns and prognoses. The presence of Choriocarcinoma is particularly significant due to its aggressive nature and propensity for early metastasis. The right testis, in contrast, showed atrophy but no malignancy. Atrophy indicates a decrease in size and function, consistent with the long-standing cryptorchidism. Fluid cytology, referring to the analysis of cells from fluid samples taken during surgery, was positive for malignant cells, suggesting potential spread within the abdominal cavity. Following the surgical intervention, the patient proceeded to adjuvant therapy, aimed at eradicating any residual microscopic disease and reducing the risk of recurrence. The patient was referred for a Medical Oncology consultation post-operatively. This referral highlights the importance of a multidisciplinary approach in managing complex cancers. Medical oncologists specialize in the use of systemic therapies, such as chemotherapy, to treat cancer. The patient received a chemotherapy regimen consisting of 4 cycles of BEP. BEP is a combination chemotherapy regimen commonly used to treat advanced testicular germ cell tumors. It comprises Bleomycin (30 units IV on days 1, 8, and 15), Etoposide (100 mg/m² IV on days 1-5), and Cisplatin (20 mg/m² IV on days 1-5). These drugs are administered every 21 days. Pre-hydration and anti-emetics were provided. Pre-hydration, the administration of intravenous fluids, is crucial, especially with Cisplatin, to protect the kidneys from toxicity. Anti-emetics are medications given to prevent or reduce nausea and vomiting, common side effects of chemotherapy. The number of cycles (4) and the specific dosages and administration schedule of the chemotherapy drugs are based on established protocols for managing this type of tumor and are tailored to the patient's risk stratification. The rationale for this chemotherapy regimen was the advanced stage of the non-seminomatous germ cell tumor (GCT) with mixed histology, specifically including choriocarcinoma. The patient was classified as likely intermediate/poor risk based on the International Germ Cell Cancer Collaborative Group (IGCCCG) criteria. The IGCCCG criteria are a widely used risk stratification system that predicts prognosis and guides treatment decisions in patients with metastatic testicular germ cell tumors. Factors considered in this classification include tumor markers, the site of metastases, and the presence of specific histological subtypes. The presence of choriocarcinoma and the extent of disease often place patients in the intermediate or poor-risk categories, necessitating aggressive chemotherapy. Long-term follow-up is essential after treatment for testicular germ cell tumors to monitor for recurrence, detect any late complications of therapy, and address survivorship issues. The follow-up schedule was structured with decreasing frequency over time. In Year 1, follow-up visits were scheduled every 1-2 months. In Year 2, the frequency decreased to every 2-3 months. In Year 3, visits were planned every 3-4 months. During Years 4-5, follow-up occurred every 6 months. Beyond 5 years, annual follow-up was recommended. This gradually decreasing frequency reflects the highest risk of recurrence in the initial years following treatment, with the risk diminishing over time. The follow-up plan incorporated several modalities to comprehensively assess the patient's condition. These included; History and Physical Examination at each visit: This involves a thorough review of the patient's symptoms, overall health, and a physical examination to detect any signs of recurrence

or complications; Serum Tumor Markers (AFP, β-hCG, LDH) at each visit: Serial monitoring of these tumor markers is crucial, as elevation can indicate residual disease or recurrence; CT Chest/Abdomen/Pelvis: Imaging with CT scans is used to monitor for any structural abnormalities or recurrence. The frequency of CT scans decreases over time, from every 1-2 months post-chemo, then every 3-6 months for Years 1-2, then every 6-12 months for Years 3-5, and then as clinically indicated; Monitoring for treatment toxicities (pulmonary, renal, neurotoxicity, cardiovascular): Chemotherapy can have both acute and long-term side effects. Monitoring for pulmonary toxicity (related to Bleomycin), renal toxicity (related to Cisplatin), neurotoxicity (peripheral neuropathy from Cisplatin), and cardiovascular complications is essential; Assessment of hormonal status (testosterone): Testicular cancer treatment, particularly bilateral orchiectomy and chemotherapy, can affect testosterone production, leading to hypogonadism. Regular assessment of testosterone levels is important to identify and manage this potential complication; Discussion of survivorship issues: This encompasses addressing the physical, psychological, and social challenges that cancer survivors may face, including fatigue, anxiety, fertility concerns, and long-term health risks. The patient demonstrated a positive initial response to treatment. Normalization of AFP and β-hCG levels was observed after 2 cycles of BEP chemotherapy. This indicates that the chemotherapy was effective in reducing the tumor burden. Additionally, a significant reduction in the size of para-aortic lymphadenopathy was seen on the post-chemotherapy CT scan, further confirming the effectiveness of the treatment in controlling the metastatic disease. At the 2-year follow-up evaluation, there was no evidence of disease recurrence based on clinical examination, imaging studies, and tumor marker levels. This indicates a successful initial treatment outcome. However, the patient was being managed for mild peripheral neuropathy, a potential long-term side effect of Cisplatin chemotherapy. Peripheral neuropathy can cause numbness, tingling, or pain in the hands and feet and can persist long after treatment completion (Table 2).

Table 1. Summary of patient's initial clinical findings.

Parameter	Finding
Demographics	
Age	29 years
Gender	Male
Ethnicity	Indonesian
BMI	29.06 kg/m² (Overweight)
Anamnesis	
Chief complaints	Abdominal pain; Bloating
Other symptoms	Awareness of a non-bothersome abdominal mass
Past medical history	No known history of cryptorchidism diagnosis or treatment
Physical exam	
Vital signs	BP: 142/69 mmHg; HR: 117/min; Temp: 36.3°C; RR: Normal
Abdomen	Enlarged; distended; tender; Palpable large mass (umbilical to symphysis)
Genitalia	Bilateral empty scrotum; testes non-palpable
Laboratory	
Serum AFP	> 400.00 ng/mL (Markedly Elevated)
Serum β-hCG	15,000 mIU/mL (Elevated)
Serum LDH	850 U/L (Elevated)
Complete blood count	WBC 9.5 x10³/µL; Hb 13.8 g/dL; Plt 280 x10³/µL (Within Normal Limits)
Basic metabolic panel	Sodium 140 mEq/L; Potassium 4.1 mEq/L; BUN 15 mg/dL; Creatinine 0.9 mg/dL (Within Normal Limits)
Imaging	
MSCT abdomen/Pelvis	Large R inguinal/intra-abdominal mass (up to umbilicus); para-aortic lymphadenopathy (L1-L4); bilateral UDT (inguinal); L testicular hypoplasia
Chest radiograph	Cor and Pulmo within normal limits; no metastasis seen
Clinical diagnosis	Malignant intra-abdominal tumor (suspected testicular GCT); Para-aortic lymphadenopathy; Bilateral Undescended Testes; Stage 1 Hypertension

Table 2. Summary of treatment procedure and follow-up plan.

Phase	Details
Surgical procedure	
Approach	Exploratory Laparotomy (Midline Incision)
Findings	Massive tumor (20x15x15 cm, 2.865 kg) originating from left intra-abdominal testis; Contralateral (right) atrophic intra-abdominal/inguinal testis (4x3x1.5 cm); Para-aortic lymphadenopathy noted on pre-op imaging.
Intervention	Resection of left testicular tumor mass; Bilateral radical orchiectomy.
Pathology result	Left Testis: Mixed Germ Cell Tumor (Seminoma and Choriocarcinoma); Right Testis: Atrophy, No malignancy; Fluid Cytology: Malignant cells present.
Adjuvant therapy	
Referral	Medical Oncology consultation post-operatively.
Chemotherapy plan	4 cycles of BEP (Bleomycin 30 units IV Day 1, 8, 15; Etoposide 100 mg/m² IV Day 1-5; Cisplatin 20 mg/m² IV Day 1-5) administered every 21 days. Pre-hydration and anti-emetics provided.
Rationale	Advanced stage non-seminomatous GCT (mixed histology with choriocarcinoma), likely intermediate/poor risk by IGCCCG criteria.
Follow-up plan	
Frequency	Year 1: Every 1-2 months; Year 2: Every 2-3 months; Year 3: Every 3-4 months; Year 4-5: Every 6 months; Annually thereafter.
Modalities	- History and Physical Examination at each visit; - Serum Tumor Markers (AFP, β-hCG, LDH) before each chemo cycle & at each follow-up visit; - CT Chest/Abdomen/Pelvis: Post-chemo evaluation, then every 3-6 months for Years 1-2, then every 6-12 months for Years 3-5, then as clinically indicated; - Monitoring for treatment toxicities (pulmonary, renal, neurotoxicity, cardiovascular); - Assessment of hormonal status (testosterone) and discussion of survivorship issues.
Initial response	Normalization of AFP and β-hCG levels after 2 cycles of BEP; Significant reduction in size of para-aortic lymphadenopathy on post-chemotherapy CT scan.
Long-term status	No evidence of disease recurrence at 2-year follow-up evaluation based on clinical exam, imaging, and tumor markers. Managed for mild peripheral neuropathy.

3. Discussion

The case presented herein underscores a critical clinical challenge, the delayed diagnosis of cryptorchidism and its severe sequelae in adulthood. Cryptorchidism, characterized by the failure of one or both testes to descend completely into the scrotum, is a relatively common congenital anomaly in male infants. While spontaneous descent occurs in many cases during the first year of life, persistent UDT poses significant long-term risks, most notably an increased risk of testicular germ cell tumors (TGCTs). In this particular instance, the 29-year-old patient had no prior history of cryptorchidism diagnosis or treatment. This absence of a known history is particularly concerning, as it suggests that the condition went undetected or unaddressed during his childhood and adolescence. Several factors might contribute to such a delay, including inadequate physical examinations during infancy or childhood, lack of awareness among parents or healthcare providers, or socioeconomic barriers to accessing healthcare. Regardless of the cause, the consequence in this case was the development of a large, advanced-stage TGCT arising from an intra-abdominal testis. The intra-abdominal location of the undescended testis significantly complicates early detection. Unlike scrotal testes, which are easily palpable and amenable to self-examination, intra-abdominal testes are hidden within the abdominal cavity. This lack of accessibility delays the recognition of any abnormal growth or changes in the testis. Consequently, tumors arising in this location often present at a more advanced stage, with larger tumor volumes and a higher likelihood of metastasis, as seen in this case. The patient's initial symptoms of abdominal pain and bloating were non-specific and could be attributed to various other gastrointestinal or intra-abdominal conditions, further contributing to the diagnostic delay. This case strongly

emphasizes the need for increased clinical suspicion for TGCTs in adult males presenting with abdominal complaints, particularly when the physical examination reveals an empty scrotum or other abnormalities of the genitalia. A thorough physical examination, including careful palpation of the scrotum and inguinal regions, is crucial in all young men presenting with such symptoms. Furthermore, clinicians should maintain a high index of suspicion for UDT even in the absence of a clear history, as patients may be unaware of or forgetful about a past diagnosis.[11-14]

The histopathological analysis of the resected tumor in this case revealed a mixed germ cell tumor composed of both seminoma and choriocarcinoma components. This histological finding has significant implications for prognosis and treatment. TGCTs are characterized by their histological diversity, reflecting the origin of these tumors from primordial germ cells. These cells are pluripotent, meaning they have the capacity to differentiate into various cell types, giving rise to the different histological subtypes observed in TGCTs. Seminomas represent one end of the histological spectrum, characterized by a relatively uniform population of cells resembling primordial germ cells. Non-seminomatous germ cell tumors (NSGCTs), on the other hand, encompass a variety of histological subtypes, including embryonal carcinoma, yolk sac tumor, teratoma, and choriocarcinoma, each with distinct morphological features and clinical behaviors. Mixed germ cell tumors, as the name suggests, contain elements of both seminoma and NSGCTs. The clinical behavior of mixed GCTs is largely determined by the most aggressive NSGCT component present. In this case, the presence of choriocarcinoma is particularly noteworthy. Choriocarcinoma is a highly aggressive subtype of NSGCT characterized by rapid growth, early hematogenous dissemination, and a propensity for metastasis to distant sites, including the lungs, liver, and brain. Even small amounts of choriocarcinoma within a mixed GCT can significantly worsen the prognosis. Choriocarcinoma cells produce large quantities of beta-human chorionic gonadotropin (β-hCG), a hormone that serves as a specific and sensitive tumor marker for this subtype. The markedly elevated β-hCG level observed in this patient (15,000 mIU/mL) was a strong indicator of the presence of choriocarcinoma and guided the subsequent treatment strategy. The coexistence of seminoma and choriocarcinoma in this case necessitated a treatment approach tailored to the more aggressive component. While seminomas are highly sensitive to radiation therapy, NSGCTs, including choriocarcinoma, are typically treated with combination chemotherapy. Therefore, the patient received a platinum-based chemotherapy regimen, which is the standard of care for advanced NSGCTs.[15-17]

The accurate diagnosis and staging of TGCTs are crucial for guiding treatment and predicting prognosis. In this case, the diagnostic evaluation involved a combination of clinical assessment, serum tumor marker measurements, and imaging studies. The patient presented with abdominal pain, bloating, and a palpable abdominal mass. Physical examination revealed the absence of palpable testes in the scrotum, strongly suggesting bilateral cryptorchidism. These clinical findings prompted further investigation for a potential testicular tumor. Serum tumor markers play a vital role in the diagnosis and management of TGCTs. Alpha-fetoprotein (AFP), beta-human chorionic gonadotropin (β-hCG), and lactate dehydrogenase (LDH) are commonly used tumor markers. Elevated levels of these markers can indicate the presence of a TGCT and provide clues about the tumor's histology and extent. In this case, the markedly elevated AFP and β-hCG levels strongly suggested a non-seminomatous GCT with choriocarcinoma elements. Imaging studies are essential for staging TGCTs and delineating the extent of the disease. Computed tomography (CT) scans of the chest, abdomen, and pelvis are the standard imaging modality for this purpose. In this case, the CT scan revealed a large intra-abdominal mass, bilateral undescended testes, and extensive para-aortic lymphadenopathy, indicating regional metastasis. These findings were crucial for determining the stage

of the disease and guiding treatment planning. The staging of TGCTs is typically based on the TNM classification system and the International Germ Cell Cancer Collaborative Group (IGCCCG) risk classification. The TNM system classifies the tumor based on its size and extent (T), involvement of regional lymph nodes (N), and presence of distant metastasis (M). The IGCCCG risk classification further stratifies patients based on factors such as tumor markers, primary tumor site, and the presence of distant metastasis, providing a more refined prognostic assessment. In this case, the patient was classified as likely intermediate/poor risk based on the IGCCCG criteria, which influenced the intensity of chemotherapy treatment.[18-20]

4. Conclusion

The case reported herein illuminates the complexities inherent in the diagnosis and management of advanced testicular germ cell tumors (TGCTs) arising from undescended testes, particularly when located intra-abdominally. The patient's presentation with a large, mixed germ cell tumor, encompassing both seminoma and highly aggressive choriocarcinoma components, underscores the potential for delayed diagnosis in the absence of typical scrotal findings. This case emphasizes the critical importance of maintaining a high index of clinical suspicion for TGCTs in adult males presenting with abdominal complaints, even without a clear history of cryptorchidism. A thorough physical examination, including careful assessment of the scrotum and inguinal regions, is paramount in identifying potential cases of UDT. Effective management necessitates a multidisciplinary approach, integrating surgical resection, adjuvant chemotherapy, and meticulous long-term follow-up. The favorable initial response to treatment in this case highlights the potential for positive outcomes even in advanced presentations while also underscoring the importance of ongoing surveillance for recurrence and treatment-related toxicities.

5. References

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