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Case Report

Treatment of Renal Agenesis Complicated with Chronic Renal Failure with Traditional Chinese Medicine: A Case Report

Dong Li[1,3†], Peipei Meng[1,2†], Hongdong Huang[2*] and Weibin Yang[3*]

[1]Guang'anmen Hospital, China Academy of Chinese Medical Sciences, China

[2*]Beijing Friendship Hospital, Capital Medical University, China

[3*]Graduate School, China Academy of Chinese Medical Sciences, China

[†]both authors are equally contributed to this work

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Corresponding author:
Hongdong Huang,
Beijing Friendship Hospital, Capital Medical University, Beijing 100050, China
Weibin Yang, Graduate School, China Academy of Chinese Medical Sciences, Beijing 100700, China
Email:

ABSTRACT

This case report describes a 33-year-old woman with congenital left renal agenesis and stage 5 Chronic Kidney Disease (CKD) who declined dialysis and sought Traditional Chinese Medicine (TCM) treatment. Initial presentation included severe fatigue and elevated serum creatinine (Scr 923 μmol/L). Following three months of integrated therapy, her Scr decreased significantly to 592 μmol/L, with marked improvement in fatigue, edema, and pruritus. This case demonstrates the potential efficacy of combined TCM-conventional approaches in managing advanced CKD, suggesting that integrated therapies may offer valuable treatment options for patients with complex renal conditions who refuse standard interventions.

INTRODUCTION

Chronic Kidney Disease (CKD) is a common and refractory condition in clinical practice, characterized by high prevalence, poor prognosis, and significant medical costs [1,2]. CKD is a progressive and irreversible syndrome that seriously endangers human health. When patients with End-Stage Kidney Disease (ESKD) present with uremic manifestations and estimated Glomerular Filtration Rate (eGFR) decreases to 15-20 $ml \cdot min^{-1} \cdot (1.73m^2)^{-1}$, renal replacement therapies are indicated [2]. However, these treatments have many contraindications and limitations. Renal agenesis complicated with chronic renal failure is rare and associated with extremely high risks of disease deterioration [3]. Herein, we present a case of CKD with renal agenesis treated with integrated Chinese and Western medicine for 3 months, with a good effect.

CASE REPORT

The patient was 33-year-old woman, with a history of congenital left renal agenesis, bilateral renal cysts and right urethral stenosis, was admitted with CKD stage 5, congenital left renal agenesis, right hydronephrosis, status post right percutaneous nephrostomy, right urethral stenosis, bilateral renal cysts, anemia of chronic kidney disease, stage 2 hypertension with very high cardiovascular risk and tonsillitis. The history was notable for congenital renal agenesis complicated by ESKD. In 2020, the patient presented to a local hospital with chief complaint of edema and fatigue. Comprehensive laboratory and imaging studies were performed. Bilateral renal

ultrasonography demonstrated congenital left renal agenesis, right hydronephrosis secondary to ureteral stenosis, left renal atrophy, bilateral renal cysts, and left renal calcifications. Based on her clinical condition and imaging findings, the local hospital recommended hospital admission for further evaluation and initiation of hemodialysis therapy. However, both the patient and her family declined dialysis treatment.

Table 1: Selected clinical laboratory results before and after treatment.

Laboratory Values	Normal Range	09-09-2023	18-10-2023	15-11-2023	06-12-2023
Erythrocyte sedimentation rate (mm/H)	Female: < 20	128	/	/	//
Hemoglobin (g/L)	Adult Females: 115~150	80	/	94	/
Creatinine (μmol/L)	Female: 45~84	923	682	708	592
Cystatin C (mg/L)	0.56~1.15	4.83	2.64	2.84	2.71
Estimated Glomerular Filtration Rate, eGFR* (mL/min/1.73㎡)	Adult: ≥90	6.49	12.23	11.33	12.95
Uric acid (μmol/L)	Female: 155~357	504	524	571	554
Brain natriuretic peptide (pg/mL)	< 100	632	/	/	/
β2-microglobulin (mg/L)	Adult: 0.8~2.4	16.7	/	/	/
Blood Urea Nitrogen (mmol/L)	3.2~7.1	/	29.39	36.43	32.16
Retinol-Binding Protein (mg/L)	25–70	/	106	/	117.1

*CKD-EPI (Scr-Scysc): eGFR = 135 x (Scr/A) B x (Scys/C) D x (0.9961) Age x E, E of female = 0.963.

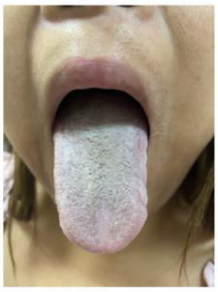

Figure 1: A pale tongue with thick white coating.

Figure 2: Dark purple sublingual veins.

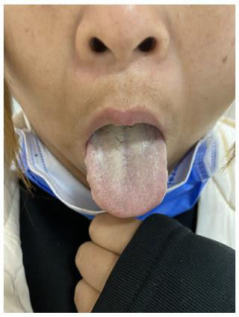

Figure 3: A pale red tongue body with white greasy coating.

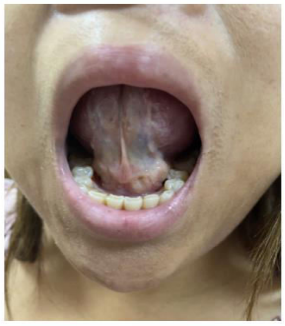

Figure 4: Light purple sublingual collateral vessels.

The patient sought traditional Chinese medicine (TCM) treatment on September 13, 2023. By then, her Serum Creatinine (Scr) was 923 μmol/L, Cystatin C (CysC) was 4.83 mg/L and Hemoglobin 80 g/L (Table 1). Abdominal Computed Tomography (CT) of her revealed post-nephrostomy status of the right kidney with persistent right hydronephrosis showing minimal interval change compared to prior studies. She presented with a 3-year history of progressive bilateral lower extremity edema and generalized fatigue. She reported decreased appetite with poor oral intake and reduced food enjoyment. Additional symptoms included darkened facial complexion, axillary pruritus, and sore throat. The patient complained of oliguria with strong ammonia odor and dark yellow discoloration. Bowel movements occurred 1-2 times daily with normal consistency. Sleep pattern remained undisturbed.

On physical examination, the patient appeared fatigued with a dull facial complexion. Bilateral lower extremity pitting edema was present. Axillary skin showed evidence of pruritus without visible lesions. Oral examination revealed a pale tongue with thick white coating and tortuous (Figure 1), dark purple sublingual veins (Figure 2). Pulse was deep and weak. Upon presentation to our institution, the patient had a clearly defined diagnosis as previously outlined—CKD resulting from congenital renal agenesis that had progressively evolved to ESKD, with coexisting renal cysts and ureteral stenosis contributing to accelerated disease progression.

Basis for TCM Disease and Syndrome Differentiation: The patient was a young female who presented with "fatigue for more than 3 years, accompanied by sore throat for 1 week." Based on the patient's primary clinical manifestations of fatigue and skin pruritus, combined with medical history and auxiliary

examinations, the TCM disease name was determined as kidney failure [4], too.

Syndrome Analysis in the perspective of TCM: This case involved a young female with congenital constitutional deficiency and insufficient kidney essence, leading to impaired Qi transformation and decreased urine output with abnormal odor. Spleen dysfunction as the acquired foundation resulted in impaired transportation and transformation, with failure of clear yang to ascend (manifesting as fatigue and poor appetite) and turbid yin failing to descend (causing edema and constipation). Prolonged dysfunction of transportation and transformation led to Qi and blood deficiency, resulting in dull complexion.

Table 2: Ingredients of the Chinese herbal medicine formula (the first time).

Latin Name	Chinese Name	Individual Dosage(g)
Pseudostellaria heterophylla (Miq.) Pax ex Pax Hoffm.	Tai zi shen	20
Astragali Radix	Huang qi	30
Rehmanniae Radix	Di huang	20
Cornus Officinalis Fructus (processed with rice wine)	Shan zhu yu	12
Dioscoreae Rhizoma	Shan yao	12
Paeoniae Suffruticosae Cortex	Mu dan pi	10
Alismatis Rhizoma	Ze xie	10
Poria Cocos Sclerotium	Fu ling	10
Cinnamomi Ramulus	Gui zhi	10
Paeoniae Lactiflorae Radix	Chi shao	10
Persicae Semen (blanched)	Tao ren	10
Rhei Radix et Rhizoma Praeparata	Da huang	10
Salviae Miltiorrhizae Radix	Dan shen	20
Amomi Fructus	Sha ren	6
Lilium brownii var. viridulum Baker	Bai he	30
Angelicae Sinensis Radix	Dang gui	10
Setariae Italicae Fructus (parched)	Gu ya	15
Hordei Vulgaris Fructus (parched)	Mai ya	15
Magnoliae Officinalis Cortex	Hou po	20
Zingiberis Rhizoma Recens	Sheng jiang	10
Ziziphi Jujubae Fructus	Da zao	30

Loss of nourishment to the orifices and accumulation of turbid toxins caused skin pruritus. Insufficient essence and blood with deficiency fire flaming upward, which manifested clinically as throat inflammation. Based on the primary symptoms, tongue, and pulse findings, the TCM syndrome was classified as Spleen-Kidney Deficiency with Internal Accumulation of Turbid Toxins. With a aim of slowing the progression of the patient's renal damage and relieving the presenting complaint, we adopted a synergistic treatment approach combining Western medicine and TCM. Her prescription consisted of the following: Compound α-ketoacid tablets 2.52g orally 4 times daily; Roxadustat capsules 50mg orally 3 times weekly; Nifedipine controlled-release tablets 30mg orally twice daily; Calcium carbonate D3 tablets 600mg orally once daily; Calcitriol soft capsules 0.25μg orally twice daily. This treatment principle targeted the core TCM pathogenesis of Spleen-Kidney Deficiency with Internal Accumulation of Turbid Toxins in CKD through the application of a formula based on Shenqi Dihuang Decoction [Detailed information on specific medications and dosages is provided in Table 2]. The herbal formula was decocted once daily and administered orally at a dose of 100 ml twice daily following filtration of the herbal residue.

At a follow-up visit on September 27, 2023, her fatigue and edema alleviated, skin pruritus had completely resolved, and appetite improved. However, food intake remained poor with occasional belching. Sleep was still balanced. Stools were loose and unformed, with increased frequency to 3-4 times daily, which was viewed as a beneficial sign of detoxification and the gradual recovery of digestive function from the perspective of TCM theory. The output of urine slightly increased. The tongue was pale with thick white coating, and sublingual collateral vessels remained tortuous and dark purple. The pulse was still deep and weak. As the patient's symptoms improved, the same treatment approach was continued. The last prescription was modified by adding bran-processed Zhiqiao (Aurantii Fructus) to promote Qi circulation and guide stagnation, and Zhebeimu (Fritillariae Thunbergii Bulbus) to transform phlegm and disperse nodulation.

Third Visit (October 18, 2023): After continued medication, the patient still experienced fatigue, but edema and skin pruritus had completely resolved. The patient presented with ammonia odor in the mouth, dry mouth, poor appetite, and frequent abdominal distension. Sleep remained acceptable. Stools were soft, occurring 2-3 times daily. Urine output was decreased with a strong ammonia odor. Tongue examination revealed a pale tongue body with thick white coating that was slightly yellow, and tortuous, dark purple sublingual collateral vessels.

Follow-up laboratory results (Table 1): Scr 682 μmol/L, Serum Uric Acid (UA) 524 μmol/L, Blood Urea Nitrogen (BUN) 29.39 mmol/L, Retinol-Binding Protein (RBP) 106 mg/L, Cys C 2.64 mg/L. Scr showed significant reduction, indicating decreased disease severity. However, laboratory values still indicated elevated creatinine and urea nitrogen levels. The same treatment

principle was maintained, with prescription modifications including increasing the dosage of Dahuang (Rhei Radix et Rhizoma Praeparata) to 12g, and replacing Zhiqiao with bran-fried Zhishi (Aurantii Fructus Immaturus) to break Qi stagnation and guide stagnation downward. Despite persistent uremic symptoms, the significant decrease in Scr demonstrated that the progression of CKD might be slow down. The prescription adjustment aimed to enhance the elimination of metabolic waste products while maintaining the core treatment strategy of tonifying Kidney-Spleen and promoting blood circulation.

Fourth Visit (November 15, 2023): The patient's appetite had recently improved significantly. Marked dry mouth was present, along with pain below the right scapula. Skin pruritus and edema had not recurred. Sleep remained acceptable. Stools were soft, occurring twice daily regularly. Urine was yellow. Tongue examination revealed a pale tongue body with thick white coating and tortuous, dark purple sublingual collateral vessels. Follow-up laboratory results in (Table 1). The patient's condition had fluctuated, likely related to recent dietary indiscretion. The scapular pain was considered related to emotional distress caused by disease recurrence. The same treatment principle was maintained, with the addition of Jinlingzi Decotion consisting of vinegar-processed Yanhusuo (Corydalis Rhizoma) 15g and stir-fried Chuanlianzi (Toosendan Fructus) 6g to relieve depression, clear heat, regulate Qi, and alleviate pain. The Western medicine treatment regimen remained unchanged.

Fifth Visit (December 6, 2023): The patient experienced mild fatigue, with pain below the right scapula significantly relieved compared to before. Appetite was acceptable with good dietary control. Dry mouth was reduced, and there was no obvious oral odor. Stools were slightly formed, occurring once daily. Urine was pale yellow with reduced odor. Tongue examination showed a pale red tongue body with white greasy coating in the posterior portion and tortuous (Figure 3), light purple sublingual collateral vessels (Figure 4). Follow-up laboratory results: Scr 592 μmol/L , UA 553.9 μmol/L, BUN 32.16 mmol/L, Cys C 2.71 mg/L, RBP 117.1 mg/L. All symptoms were alleviated, and disease severity was significantly reduced, confirming treatment efficacy. The same treatment principle and prescription were maintained with combined tonification and purgation. The dosage of Qi-tonifying herbs was increased, specifically increasing Huangqi (Astragali Radix) dosage and adding Ejiao Zhu (Asini Corii Colla, processed) to nourish Yin and blood. The Western medicine treatment regimen remained unchanged.

DISCUSSION

This case presents a patient diagnosed with renal agenesis and Stage 5 CKD, characterized by severe kidney dysfunction with less than 15% kidney function capacity. Following a comprehensive treatment protocol that included 56 doses of herbal medicine combined with conventional therapies, remarkable clinical improvement was observed. Serial laboratory monitoring demonstrated a significant reduction in Scr from 923 μmol/L to 592 μmol/L by the fifth follow-up visit, representing a substantial decrease of 331 μmol/L (35.9% reduction). This quantitative improvement in renal function parameters was particularly noteworthy, as the patient's condition progressively improved from the uremic stage toward the azotemic stage [2].

Western Medicine Treatment Analysis

CKD refers to kidney damage and/or declining kidney function persisting for more than 3 months. It encompasses various kidney diseases with insidious, usually irreversible progression [2]. Once ESKD develops, renal replacement therapy becomes necessary for survival, severely impacting quality of life and imposing significant economic burden on individuals and society [1,5]. While dialysis therapy and renal transplantation constitute the standard renal replacement therapies for patients with ESKD [6], both present distinct limitations and associated complications. Dialysis treatment, though life-sustaining, is associated with various complications including dialysis disequilibrium syndrome, cardiovascular complications, and neurologic manifestations such as dialysis dementia [7,8], . Furthermore, chronic dialysis requires significant lifestyle modifications and carries risks of infection, vascular access complications, and progressive deterioration in quality of life [9]. Similarly, kidney transplantation, despite offering the best long-term outcomes for eligible patients, presents substantial challenges including the risk of acute and chronic rejection, requiring lifelong immunosuppressive therapy with associated complications [10,11]. Additional limitations include organ shortage, surgical risks, increased susceptibility to infections and malignancies due to immunosuppression, and the potential for transplant failure

necessitating return to dialysis. Fortunately, addressing complications arising from chronic kidney disease remains essential, including the use of α-keto acids and rosuvastatin. Additionally, proactive measures for infection prevention and rehabilitation management are significant benefit [12].

Traditional Chinese Medicine Treatment Analysis

Based on TCM theory, the treatment of CKD ought to focus on 3 core principles: First, given that CKD follows a protracted course where prolonged Qi deficiency eventually damages both Yin and Yang, leading to dual deficiency of Qi and Yin [13,14], the primary therapeutic approach should emphasize tonifying Qi and nourishing Yin, with minimal addition of Yang-warming herbs to restore Qi transformation while avoiding excessive use of Kidney Yang-tonifying medications that may generate Dryness-Heat and further damage Yin. Shenqi Dihuang Decoction serves as the representative formula [15], embodying the therapeutic concept of tonifying Qi and nourishing Yin, supplementing Kidney and nourishing blood while promoting diuresis. Second, emphasis should be placed on strengthening the Spleen & Ttomach as the acquired foundation to support Kidney Deficiency. For patients with renal agenesis, this can be viewed as a special form of 'Depletion of Tiangui (heavenly tenth)' [16]. Based on Five Element theory, nourishing Earth generates Metal while Metal and Water mutually generate each other, and simultaneously, nourishing Earth controls Water to break the pattern of "excessive Water overwhelming Earth."

This is achieved through strengthening the Earth of Spleen and protecting Stomach Qi to assist kidney's storage function. Third, in CKD stages 4-5, excess patterns are prominent, commonly manifesting as Water-Dampness, Damp-Heat, and Blood Stasis [17,18]. These pathogenic factors are persistent and difficult to eliminate, necessitating the principle of "supporting the upright to expel pathogens" - clearing and draining Damp-Heat while tonifying Qi and nourishing Yin, providing pathogenic factors with an exit route by expelling them through bowel movements, while paying attention to the relationship among Water, Qi, and Blood [19]. Additionally, considering the possibility of emotional damage in patients, appropriate inclusion of Liver-soothing, depression-relieving, and Qi-moving formulas should be considered, embodying the therapeutic principle that 'without removing stagnant and old, one cannot promote renewal and regeneration.'

Treating chronic diseases values adherence to treatment principles, with the difficulty lying in prescription consistency. CKD treatment and care require relatively long periods. Under precise pattern differentiation of TCM, when patients show only slight improvement, or even disease recurrence after medication, the physicians must carefully deliberate, boldly yet cautiously re-examine patterns and pathomechanisms of TCM, and firmly maintain treatment principles and prescriptions. As the old Chinese saying goes, 'The last ten miles of a hundred-miles journey represents half the total effort.'

The integration of TCM with conventional treatment modalities showed promising therapeutic outcomes, consistent with emerging evidence supporting the potential benefits of herbal interventions in CKD management [20,21]. The patient continues under close medical supervision with ongoing consolidation therapy, maintaining stable clinical status with expectations for further renal function improvement. This case demonstrates the potential for alternative therapeutic approaches in managing advanced CKD, warranting continued investigation and careful monitoring of treatment outcomes.

CONCLUSION

We report a case of stage 5 CKD with congenital renal agenesis successfully managed through integrated traditional Chinese and Western medicine approach. This case suggests that integrated therapy model may offer potential benefits for advanced CKD patients who could not using standard renal replacement therapies. However, optimal treatment protocols, standardized syndrome differentiation, and long-term outcomes require further investigation through well-designed clinical studies to establish evidence-based guidelines for this challenging patient population.

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