

Surgical Treatment of Secondary Hyperparathyroidism in Surgery B of Chu of Point G

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Abstract

Purpose: To describe the epidemiological, clinical and therapeutic aspects of secondary hyperparathyroidism in renal failure chronic. **Patients and methods:** We collected 11 cases of hyperparathyroidism secondary to renal failure terminal operated in the Service of surgery B of the Central Hospital University of Point G between December 2016 and November 2018. **Results:** The sex ratio was 0.22 in favor of women. The average age of the patients was 43 or 27 years with extremes of 63 and 25 years. Secondary hyperparathyroidism in renal failure chronic represented 1.9% of interventions to cold in the Service of surgery B. 100% of patients (11/11) were haemodialysis. 100% of the patients had clinical and biological signs. 45.5% (5/11) had radiological signs. The average rate of parathyroid hormone was 2413.51 pg/ml with extremes of 1264 pg/ml and 3616 pg/ml. The reference value was 15 - 65 pg/ml. The surgical technique of choice was the 7/8th parathyroidectomy in 100% of cases. The postoperative were simple in 81.8%, and complicated in 18.2%. There were no death. The average duration of postoperative follow-up was 6 months. After surgery, 50% of patients (5/10) had normal levels of parathyroid hormone and 50% (5/10) made a persistent hyperparathyroidism. **Conclusion:** Secondary hyperparathyroidism is a frequent complication in renal insufficient chronic in hemodialysis. Surgery is indicated in the resistant cases of medical treatment. The 7/8th parathyroidectomy is the surgical technique of choice. The rate of post operative complications is higher in our context.

Keywords

Secondary Hyperparathyroidism, Treatment, Surgery

1. Introduction

Hyperparathyroidism is the set of clinical, biological and anatomical demonstrations as a result of hyper secretion of parathyroid hormone (PTH) by the parathyroid glands.

Hyperparathyroidism can be primary (parathyroid adenoma in 80% - 85%, primitive hyperplasia in 14% - 15% and carcinoma < 1%), secondary (compensatory hyperplasia due to a decline in the rate of calcium in the renal insufficient chronic), or tertiary (autonomous hyperactivity of the parathyroid). Secondary hyperparathyroidism is a common complication in chronic renal failure [1]. It is an inevitable condition in chronic renal insufficient patients at the stage of hemodialysis; because it is the result of an alteration extended responsible for kidney function of phosphocalcic metabolism disorder. The increase in the secretion of PTH trained parathyroid hormone, a hypocalcémie, a hyperphosphorémie, a deficiency in vitamin D [1].

The diagnosis is mentioned before the clinical and radiological components but the confirmation is based on the immunoassay of the serum of parathyroid hormone (PTH serum). The hearing is before any medical; however these therapies are limited by their lack of effectiveness in the long term. The morbi-mortality is linked to osteo-articular and cardiovascular complications. When the hyperparathyroidism becomes uncontrolled, the parathyroidectomy remains the reference. The purpose of this work was to describe the epidemiological, clinical and therapeutic aspects of hyperparathyroidism secondary to chronic renal failure in the Service of surgery B of the Central Hospital University of Point G.

2. Patients and Methods

It was a retro-prospective descriptive and analytical study which took place in the Service of surgery B of CHU of Point G from December 2016 to November 2018 or a duration of 24 months. We have included all patients who have been operated for secondary hyperparathyroidism confirmed by dosage of the parathyroid hormone in the Service of surgery B of the Point G Academic Hospital Center.

Have not been included in this study:

- Patients with non-exploitable records;
- Other hyperparathyroidism (primary and tertiary);
- Secondary hyperparathyroidism medically treated (not operated).

Judging criteria:

We have defined secondary hyperparathyroidism in chronic renal failure according to the international recommendations of Kidney Disease Improving Global Outcome (KDIGO).

At the terminal stage of chronic renal failure, we target to maintain between 2 to 9 times the upper limit of the standard of the dosage used (**Table 1**).

The reference value of the Parathyroid hormone in the blood was 15 - 65

pg/ml in a laboratory of Bamako.

To make the diagnosis we relied on the clinical, radiological and biological arguments.

Cervical ultrasound has allowed us to objectify the pathological glands.

The surgical indication was asked before the failure of medical treatment with a rate of PTH over 1000 pg/ml.

All patients were dialyzed 24 hours before surgery and immediately after surgery.

Post operative follow-up was based on the dosage of the parathyroid hormone and standardization in the range of 2 to 9 times (the reference value of the parathyroid hormone in the blood of the laboratory was 15 - 65 pg/ml) either 130 - 585 pg/ml (**Table 2**).

The postoperative follow-up of the patients was done immediately Postoperatively, at 1 week, 1 month, 3 months, 6 months, 1 year, 2 years as shown in **Table 3**.

The minimum duration of patient follow-up was 6 months:

Data processing and analysis were done on the Microsoft Windows software version 2007, SPSS 12.0 for Windows. The probability test used was Chi² with a threshold of meaning $p < 0.05$.

Table 1. Definiton of secondary hyperparathyroidism in renal failure chronic according to international recommendations of Kidney Disease Improving Global Outcome (KDIGO).

KDIGO	PTH (pg/ml)
Subjects without renal failure	10 - 60
Insufficient renal terminal	2 to 9 times the limit superior of the normal

Table 2. Distribution of patients for secondary hyperparathyroidism according to the results of biological pre-operative balance.

Patient N°	Calcemie going = 2.15 - 2.55 mg/l	Phosphoremie going = 2.50 - 4.50 mg/l	Rate of parathyroid hormone (PTH) is = 15 - 65 pg/ml	Alkaline phosphatase (PAL) going = 35 - 104 UI/l	Total Vitamin-D will = 20 - 40 ng/ml
1	2.61	3.09	3250.12	205	35.35
2	2.09		1307	240	
3	2.29	3.38	1257	347	54.05
4	2.50	5.30	3351	120	34.36
5	2.31	5	2269	-	27.49
6	2.27	3.78	2273	187	15.08
7			3325		
8			3616		
9	2.46	7.07	1793		30.74
10	3.32	4.42	2843.50		18.06
11	2.18	3.03	1264		
Moyenne			2413.51		

Table 3. Distribution of patients for secondary hyperparathyroidism according to the results of biological immediate post operative balance and long-term.

Patient N°	Rate of PTH pre operating	Rate of PTH post surgery immediate	1 week	1 month	3 months	6 months	1 year	2 years
1	3250.12	665.50	986.10	1056	400	462.8	507.7	585
2	1307			915		1007	1057	
3	1257				480	457		
4	3351	719.33				768.1	630	
5	2269			2094			1675	
6	2273	934.16			509	324	465	
7	3325	2504	3024			2922	3000	
8	3616	3501	2215			2886	3435	
9	1793	349.70		1063	821.9	714.5	428.2	
10	2843.50	1678.6			118.9	114.5		
11	1264	7.5			104.8	131.7		

3. Results

We have collected 11 cases of secondary hyperparathyroidism in renal failure terminal operated in the service.

The sex ratio was 0.22 for women either 9 women (81.80%) and 2 men (18.20%).

The average age of the patients was 43.27 years with extremes of 25 and 63 years.

Secondary hyperparathyroidism in renal failure chronic terminal represented 1.9% (11/581) of interventions to cold in the Service of surgery B.

81.8% of the patients (9/11) were hypertensive and 100% of patients (11/11) had an IRC.

100% of patients were made for FAV once or twice.

Hemodialysis has been the type of dialysis performed in 100% of patients.

Clinical signs were osteoarticular (arthralgia, bone pain) in 91% of cases (10/11), neuro-muscular events (cramping, weakness) in 91% of cases (10/11), skin events (pruritus, calphylaxie) in 18.2% of cases (2/11), lesions of scraping in 18.2% of cases (2/11), deformations of members in 18.2% of cases (2/11), an as-thenia in 100% of cases. The radiological signs were a bone resorption in 18.2% of cases (2/11), a bone demineralization in 9.1% of cases (1/11), a brown tumors in 9.1% of cases (1/11), a fracture in 9.1% of cases (1/11).

The ultrasound of the neck all patients objectified a parathyroid nodule in 45.5% cases (5/11), multiple nodules parathyroid in 27.3% of the cases (3/11), hyperplasia broadcasts parathyroid + below goiter in 18.2% of cases (2/11), a parathyroid nodule + an isthmic intra nodule in 9.1% of cases (1/11).

The echo heart was carried out in 18.2% of cases (2/11), cervical scanner in

18.2% of cases (2/11), the chest radiography in 18.2% of cases (2/11). We did neither the scintigraphy nor the extemporaneous examination of the operating room nor the per operative dosage of the parathyroid hormone.

In pre-operative the average rate of PTH was 2413.51 pg/ml and ranged from 1257 and 3616 as shown in **Table 2**.

The previous cervicotomy transversal type Kocher has been the path of surgical first performed in 100% of cases.

The surgical technique performed was the subtotal parathyroidectomy or the 7/8th at 100% of the patients. It consisted of the complete removal of the 3 parathyroid glands (of pathological aspect) and half of the last (of healthy appearance) parathyroid gland. We have not conducted any total parathyroidectomy according to Wells.

As gestures associated with the parathyroidectomy, we realized the subtotal thyroidectomy in 18.2% of cases (2/11), the left isthmo-lobectomy in 9.1% of cases (1/11).

Pathological examination of the parts operating entered into a parathyroid adenoma in 63.6% of cases (7/11), parathyroid hyperplasia in 36.4% of cases (4/11).

The postoperative were simple in 81.8% of cases (9/11), complicated in 18.2% (2/11). These 2 complications were a compressive cervical hematoma that was evacuated in emergency by a drain (Redon) and a surgical site infection. We have not recorded lesion of the lower laryngeal nerve.

There has been no death (mortality zero).

After 6 months postoperative the rate of PTH has been dosed in 10 patients. He was in the standard desired in 50% of cases (5/10), superior in 50% of cases (5/10).

4. Discussion

Limitations of the study:

We didn't the scintigraphy, surgery was performed on the basis of knowledge in anatomy.

We did neither the extemporaneous examination of the operating room nor the per operative dosage of the parathyroid hormone.

The sex ratio for women in our study (7.2) is consistent with the data in the literature [2] [3] [4].

The female is a risk factor in the occurrence of secondary hyperparathyroidism in chronic renal insufficient patients [1]. The relative risk is multiplied by 2 due to a hypersensitivity to the action of PTH associated with ovarian dysfunction (anovulation and amenorrhea) predisposing to bone consequences rise in hyperparathyroidism secondary [5].

All patients in our study conducted a hemodialysis. Hemodialysis has been practiced in 90% - 100% by the authors [1] [2] [5]. The reference value of PTH in this study was 15 - 65 pg/ml, and the average rate parathyroid hormone was 2413.51 pg/ml as shown in **Table 2**.

The diagnosis of hyperparathyroidism secondary to renal failure chronic is suspected by clinical and radiological arguments, but the diagnostic confirmation was based on the blood dosage of parathyroid hormone (PTH); top two to nine times the upper reference value of laboratory [1] [2] [5].

Surgery is reserved for situations in which the rate of PTH is higher than 1000 pg/ml, associated with resistance to medical treatment and clinical signs.

This definition has been shared by all of the authors [1] [2].

The surgical technique of choice was the 7/8th parathyroidectomy.

Several authors have suggested that the 7/8th parathyroidectomy as the technique of choice for a first surgery and the total parathyroidectomy with auto transplantation of parathyroid tissue according to Wells after failure of the subtotal parathyroidectomy [1] [2] [6].

The most frequent histological type was the parathyroid adenoma in 63.6% of the cases. There were 36.4% of parathyroid hyperplasia.

The histological type of parathyroid hyperplasia is correlated with the severity of hyperparathyroidism secondary [2].

The rate of post operative complications is higher in our study (18.2%).

This rate is statistically identical to that of Magali (10.8%, $p = 0.08$) [5] but higher than H. Sayad (3.5%, $p < 0.05$) [2] and Alek Sander (3.5%, $p < 0.05$) [3].

This difference can be explained by our short experience in parathyroid surgery.

The mortality rate was 0% in our study.

This rate is statistically identical to that of Magali (1.7%, $p = 0.12$) [5] but lower than H. Sayad (7.01%, $p < 0.05$) [2] and Tsung Liang Da (6.7%, $p < 0.05$) [6].

This statistical difference can be explained by the small size of our sample.

According to the results of biological balance (PTH) of 6 months post operative the failure rate of surgical treatment in our study was 50% (Table 3). It is high compared with literature data ranging from 3.50% to 42.85% [1] [2] [5].

This can be explained by the lack of diagnostic facilities including scintigraphy, which helps guide the surgical gesture with precision; as well as operating per dosage of PTH and frozen review that help the success of the surgical act.

5. Conclusion

Secondary hyperparathyroidism diagnosis is clinical, and radiological, but confirmation is biological (PTH Dosage). Surgery is indicated in cases of secondary. Hyperparathyroidism is resistant of medical treatment. Scintigraphy is now essential for the success of operative surgery as well as the dosage peroperative of the parathyroid hormone and frozen review of the operating room. The 7/8th parathyroidectomy is a therapeutic way course in the treatment of severe secondary hyperparathyroidism in the insufficient chronic renal.

Authorization of the Ethics Committee

We, undersigned, authors of this article give evidence that we received the au-

thorization of the Ethics Committee for the realization of this study.

Conflicts of Interest

The authors state that there is no conflict of interest in the publication of this article.

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