

Dental Implant Survival in Patients With Long-Term Use of Injectable Corticosteroids: A Retrospective Study



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Introduction

- It is well-documented that **dental implant treatment may be contraindicated** in patients with long-term use of systemic corticosteroids due to impacts on **osteoblast and osteoclast function**.^{1,2,3,4,5}
- Long-term corticosteroid use, defined as 3 months or more, **affects bone metabolism by acting on the hypothalamic-pituitary-adrenal axis⁶, renal uptake of calcium⁷, and adipocyte accumulation leading to avascular necrosis.⁸**
- The use of long-term injectable **corticosteroids** in patients with **osteoarthritis** has been a standard practice for over 30 years prior to **terminal treatment, total joint replacement**.^{9,10,11}

Primary goal of this investigation: to quantify dental implant survival in the previously unstudied population of patients with long-term use of injectable corticosteroids, based on patients with a history of total joint replacement.

Materials & Methods

- Data was gathered at the implant and subject level with inclusion criteria: patient response “yes” to past total joint replacement, having at least one dental implant placed within our institution, and a follow-up time of at least 5 years.
- Survival of the dental implant was based on patient records with the failure date being recorded as the date of removal of the implant.

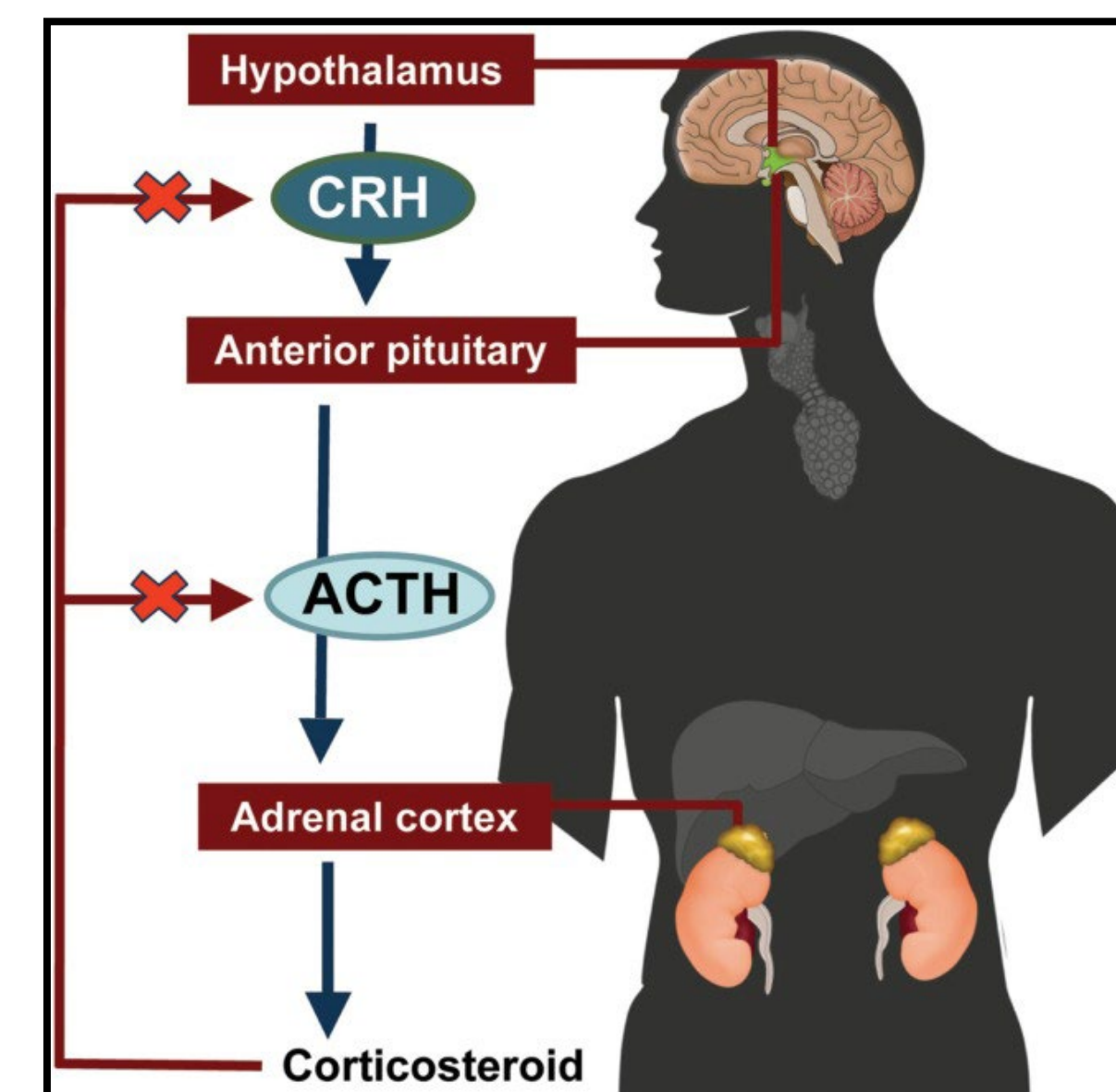


Figure 1: Hypothalamic-pituitary-adrenal axis¹²

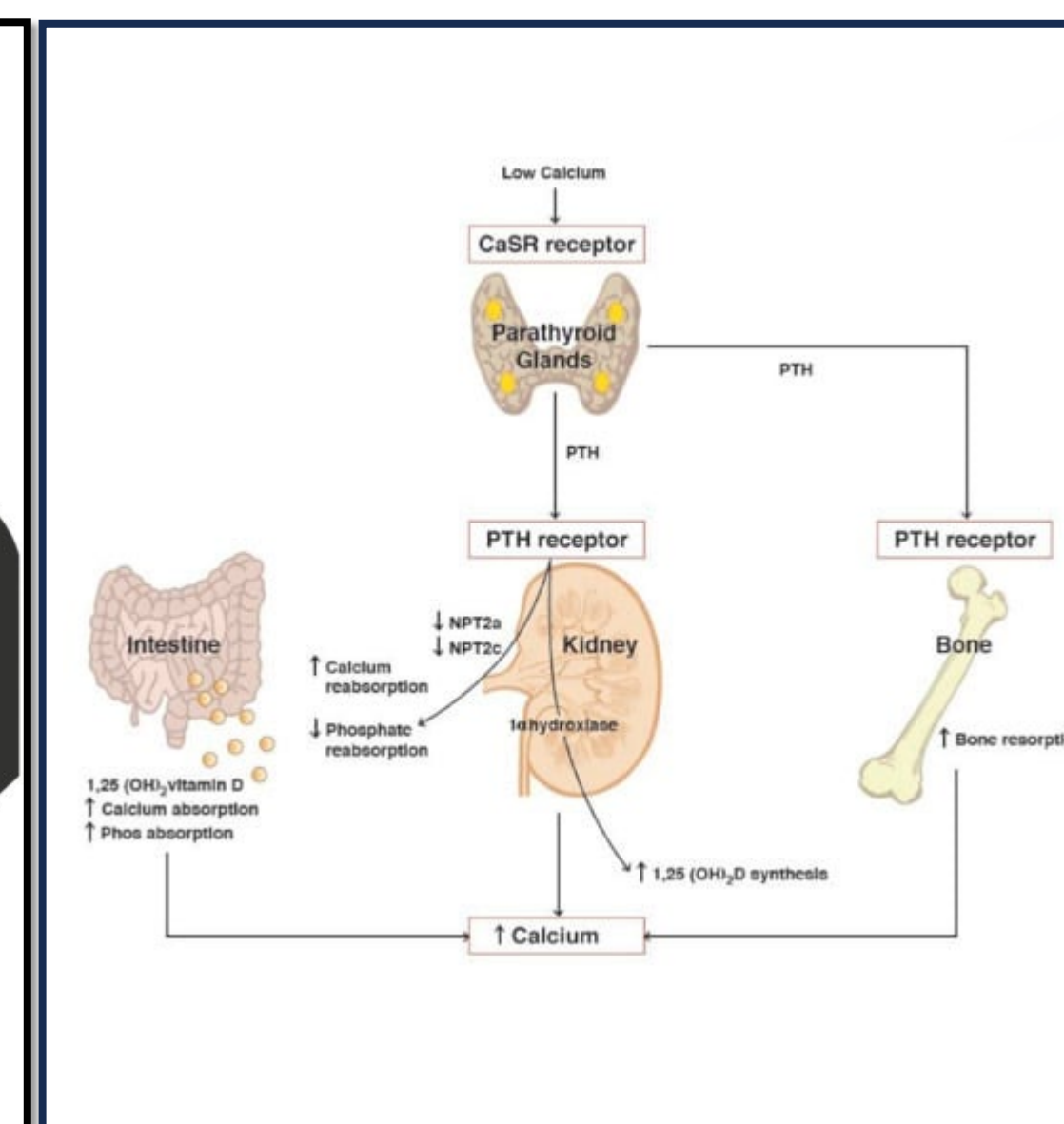


Figure 2: Calcium metabolism¹³

N = 101 patients; n = 370 dental implants				
Age	Mean	SD	Range	Shapiro-Wilk
	79.08	9.88	57 - 99	0.2429
Implant follow-up time (yrs)	Median	IQR		
	9.56	6.69, 12.78	0.15 - 20.38	0.0004
Subject level			Number of patients with at least 1 implant failure	Percent of patients with at least 1 implant failure
	N	% of total		P (likelihood ratio)
Sex				
	Male	38 37.6%	9	23.7%
	Female	63 62.4%	11	17.5%
				.4507
Hypertension (as reported)				
	Yes	76 75.2%	15	19.7%
	No	25 24.8%	5	20.0%
				.9772
Diabetes Mellitus (as reported)				
	Yes	21 20.8%	5	23.8%
	No	80 79.2%	15	18.8%
				.6107
Joint type				
	Hip, Knee, or Ankle	97 96.0%	20	20.6%
	Other	4 4.0%	0	0.0%
				.6107
Smoking (as reported)				
	Ever	21 20.8%	5	23.8%
	Never	80 79.2%	15	18.8%
				.1790
Total patients		101	20	19.8%
Implants (dental)	n	% of total		
	Survived	332 89.7%		
	Failed	38 10.3%		

Table 1: Demographic data of included subjects.

Results

Relative Risk for Implant failure (implant level Cox PH analysis, n=370)	Univariate		Multivariate	
	RR (95% CI)	P	RR (95% CI)	P
Men vs. women	1.41 (0.75, 2.68)	.286	1.76 (0.91, 3.40)	.0941
HTN vs. not HTN	0.62 (0.31, 1.24)	.1756	0.58 (0.29, 1.16)	.1237
DM vs. not DM	0.52 (0.22, 1.24)	.1422	0.48 (0.20, 1.15)	.0983
Smoking, ever vs. never	0.74 (0.32, 1.68)	.4681	0.64 (0.28, 1.47)	.2887

Table 2: Risk ratios for dental implant failure in patients with history of previous total joint replacement; subgroup analysis.

	1 year	5 year	10 year	Log-rank
	RR (95% CI)	RR (95% CI)	RR (95% CI)	
All	0.96 (0.94, 0.97)	0.92 (0.89, 0.94)	0.90 (0.86, 0.92)	
Women	0.98 (0.96, 0.99)	0.94 (0.91, 0.96)	0.91 (0.86, 0.94)	.2833
Men	0.94 (0.90, 0.97)	0.90 (0.85, 0.94)	0.88 (0.82, 0.92)	
With Hypertension	0.96 (0.94, 0.98)	0.93 (0.89, 0.95)	0.91 (0.87, 0.94)	.1713
Without Hypertension	0.97 (0.92, 0.99)	0.90 (0.83, 0.95)	0.85 (0.76, 0.91)	
With Diabetes	0.97 (0.93, 0.99)	0.95 (0.89, 0.98)	0.94 (0.87, 0.97)	.1349
Without Diabetes	0.96 (0.93, 0.97)	0.91 (0.87, 0.94)	0.88 (0.84, 0.91)	
History of Smoking	0.97 (0.92, 0.99)	0.94 (0.87, 0.97)	0.92 (0.84, 0.96)	.4661
Never Smoked	0.96 (0.93, 0.97)	0.92 (0.88, 0.94)	0.89 (0.85, 0.92)	

Table 3: Dental implant survival estimates for patients with history of previous total joint replacement (implant level, n=370), K-M log-normal fit, 95% CI)

Conclusion

- Within the limitations of this study, **it does not appear that patients within this population are at an increased risk for dental implant failure.**
- Long-term use of injectable corticosteroids or history of total joint replacements should not change the course of our treatments.

References

