
Article:
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Title:

Preservation vs. resection of the infrapatellar fat pad during total knee arthroplasty Part 1: A survey of current practice in the UK.

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Abstract

Background:
The management of the infrapatellar fat pad (IPFP) during total knee arthroplasty (TKA) is the subject of ongoing debate. In part 1 of this 2 part series, we present an overview of current practice regarding the management of the IPFP in elective TKA amongst surgeons in the UK.

Methods:
A web-based survey was offered to 269 delegates of the BASK 2017 annual conference.

Results:
The survey showed a large variation in practice. Of the 173 responders: 86.7% were consultants. 62.4% partially resected the IPFP. 23.1% totally resected the IPFP and 9.8% preserved it. 40% felt that resection made a difference. Only 23% stated that they were aware of guidelines/evidence.

Conclusion
There is wide variation in practice with regard to the IPFP in TKA. The available literature with regards to resection or preservation of the IPFP is not conclusive.

Implications:
There are no definitive guidelines available for the management of the IPFP in TKA resulting in a wide variation in practice among surgeons.

Introduction

Total knee arthroplasty (TKA) is the most frequently performed arthroplasty procedure in the United Kingdom [1]. The infrapatellar fat pad (IPFP), or Hoffa's fat pad, is often totally or partially resected during TKA in order to aid surgical exposure.

The IPFP is an intracapsular structure found in the anterior knee compartment [2]. It has attachments to the inferior pole of the patella and proximal patellar tendon [2]. There is a rich anastomotic blood supply to the IPFP including supply to the patella and patellar tendon [3, 4]. As well as its role in blood supply to the anterior knee structures, the IPFP is thought to play a role in an inflammatory process leading to anterior knee pain [5]. The IPFP also contains nociceptive fibres which adds credence to the IPFP being a possible source of anterior knee pain [6, 7]. The exact functions of the IPFP, however, in health and disease is relatively unknown [3].

Studies favouring preservation of the IPFP during TKA cite an increased risk of scarring and therefore shortening of the patellar tendon caused by disruptions of the anastomotic links that exist in the IPFP [8]. The resulting shortening of the patellar tendon is then thought to contribute to increased stiffness of the knee, patella baja and altered kinematics [8-10]. Resecting the IPFP is also thought to disrupt the blood supply to the patella and therefore increase the risk of fracture [11]. Pinsornsak et al also describe increased pain related to IPFP resection [12]. Some studies have found varied evidence of anterior knee pain with IPFP resection during TKA [13]. Macule et al found increased pain in patients who had the IPFP preserved at 1 month and at 6 months [14]. The same study also found no difference in patellar tendon length also at 1 month and 6 months [14].

It is clear that the management of the IPFP during TKA is subject of ongoing debate with no clear consensus. The choice of IPFP resection, preservation, or partial resection varies based on surgeon’s preference, experience and patient needs. The aim of this paper, part 1 of a 2 part series, was to understand current practices regarding the management of the IPFP in elective TKA amongst surgeons in the UK.

Methods

Study Design

A web-based survey was designed to ascertain routine practice with reference to the IPFP in elective total knee arthroplasty. The survey was offered for completion by the 269 delegates of the BASK 2017 annual conference who completed a post conference survey. Data was collected using SurveyMonkey during the period from 4th April 2017 to 10th May 2017.

The Questionnaire

The survey consisted of five questions which are shown with their corresponding answer options in Table 1.

Data Analysis

Descriptive statistics and graphical representation were used to summarize the responses given by the BASK delegates to the questionnaire.

Results

Out of the 269 requests; 45 indicated that they did not undertake total knee replacement surgery and 173 responded yielding a response rate of 77%.

Question 1: Of the 173 responders 150 (86.7%) were consultants and the remaining; 13.3% consisted of knee fellows (5), career grade specialists (4), Specialist Trainees (13), and a junior doctor (Figure 1).

Question 2: The majority (62.4%) of responders partially resected the IPFP. 23.1% totally resected the IPFP and 9.8% stated they preserve the IPFP (Figure 2).

Question 3: In response to question 3 the majority (70%) specifically cited visualisation & exposure as the reason for their approach to the management, 9% cited patella infera/baja and 7% vascularity of the patella tendon. A number of other reasons were also cited; for example training, pain, improved PROMS and anecdotal evidence. The specific answers given by the participants can be viewed in appendix A (ref as online data).

Question 4: The majority, 76.7%, surgeons responded saying that they were not aware of any guidelines or evidence regarding IPFP-Resection (IPFP-R) as opposed to 23.3% who were (Figure 3). Among those who were aware of guidelines there was wide variation of evidence cited from expert opinion to a systematic review.

Question 5: When explored in detail it was noted that over 40% of surgeons felt that either resection or preservation made a difference to outcome. Of those that felt that resection had an effect, 40% felt resection resulted in a reduced blood supply to the patella and patellar tendon shortening (Figure 4).

Discussion

There are currently no formal national guidelines in the UK with regard to preservation or resection of the IPFP during TKA. The aim of this study was to understand the current practices regarding the management of the IPFP in TKA by means of a web-based survey.

The survey highlights that there is a wide variation in practice among surgeons in the management of the IPFP during total knee arthroplasty. The most striking finding from the survey was that more than 3 in 4 knee surgeons were not aware of any evidence to guide their decision making with regards to their management of the IPFP.

The majority (62.4%) of surgeons favoured partial resection in their practice. The majority cited achieving adequate exposure of the lateral tibia as the reason for total or partial resection and a number of surgeons who preferred preservation stated that in cases of difficult exposure they would proceed to partial resection. A small number of surgeons felt that preservation was associated with increased anterior pain post-operatively. This concept has been discussed in the literature as the IPFP is thought to play a role in an inflammatory process [5] and contains nociceptive fibres which adds credence to the IPFP being a possible source of anterior knee pain [6, 7, 23]. The IPFP has also been shown to contain peptidergic C- and substance P positive nerve fibres[23]. However there is no clear evidence that preservation leads to an increased incidence of pain.

This survey was offered to the delegates of the BASK 2017 annual conference which has limitations in that participants would in the majority practice in the United Kingdom (with a minority of international delegates). This is a limitation as these results may not extrapolate to an international cohort.

Conclusion

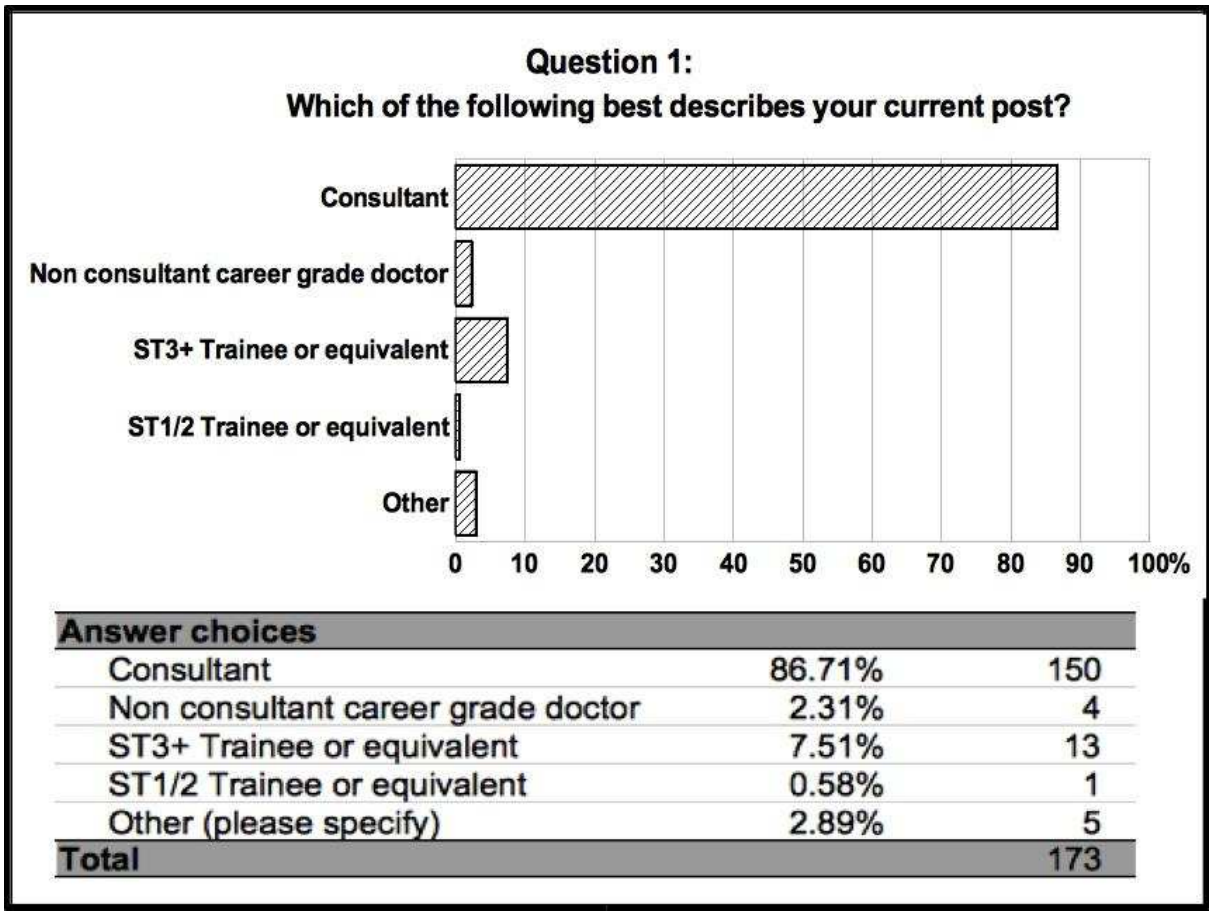
IPFP-R verus IPFP-P during TKA is a controversial topic with no clear consensus in the literature. From the survey results we can surmise that in addition to a large variation in practice there is also an ongoing debate among surgeons regarding the influence of infra patellar fat pad resection.

Tables:

1	**Which of the following best describes your current job level?**
	Consultant Associate Specialist Registrar Other (please specify)
2	**When performing a total knee arthroplasty what is your preferred management of the infrapatellar fat pad (Hoffa's fat pad)?**
	Total resection Partial resection preservation Other (please specify)
3	**Why do you choose your management of the IPFP when you perform TKA?**
	open answer
4	**Are you aware of any guidelines or evidence regarding infrapatellar fat pad resection?**
	Yes (please specify) no
5	**Do you feel that resection of the fat pad contributes to:**
	increased incidence of patella tendon shortening increased incidence of anterior knee pain altered knee kinematics decrease in immune mediators and growth factors produced by the infrapatellar fat pad none of the above/ makes no difference other (please specify)

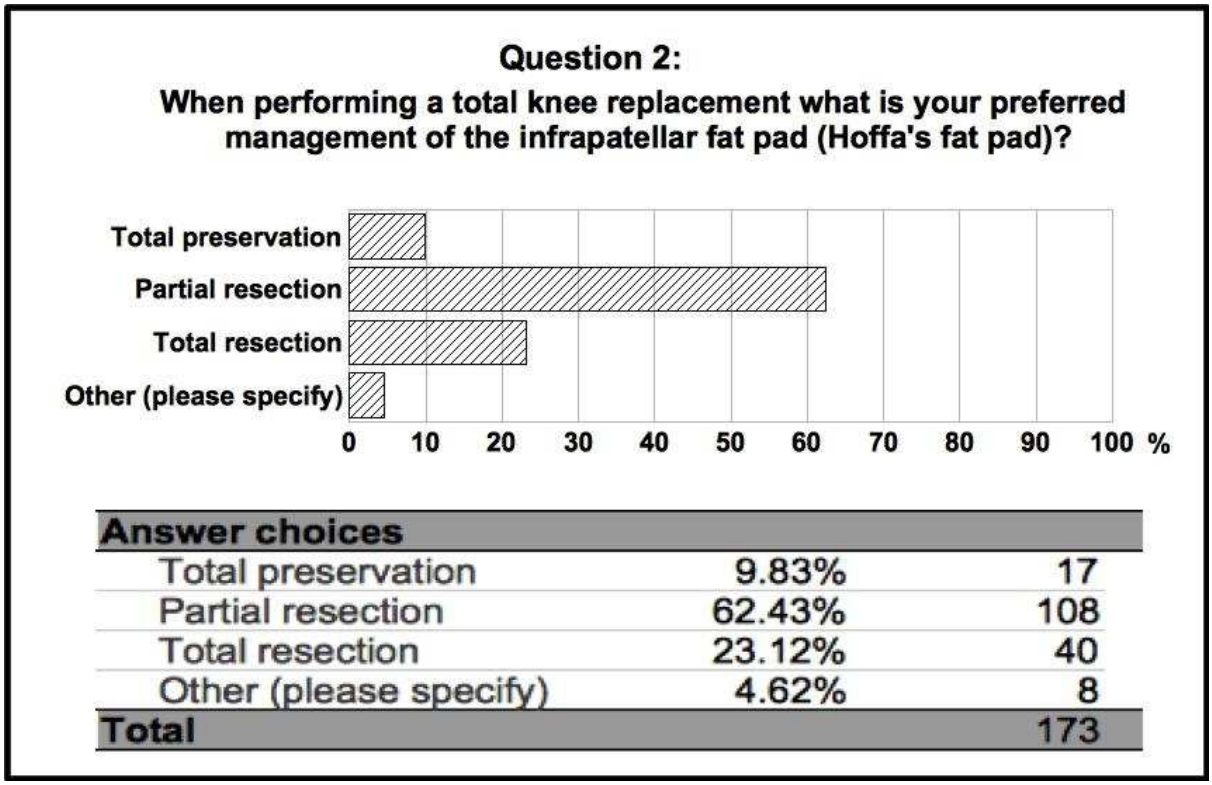
Table 1: Table showing the questions put to the participants and the answer options which they were able to select. Free text answers were allowed where participants were asked to *"please specify"*.

Figures:



Answer choices		
Consultant	86.71%	150
Non consultant career grade doctor	2.31%	4
ST3+ Trainee or equivalent	7.51%	13
ST1/2 Trainee or equivalent	0.58%	1
Other (please specify)	2.89%	5
Total		173

Figure 1: Chart showing the distribution of career levels among the survey respondents.

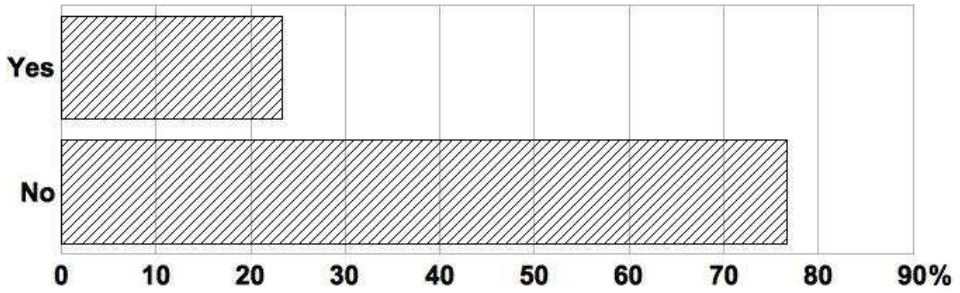


Answer choices		
Total preservation	9.83%	17
Partial resection	62.43%	108
Total resection	23.12%	40
Other (please specify)	4.62%	8
Total		173

Figure 2: Chart showing the preferred management of the IPFP during TKA among the survey respondents.

Question 4:

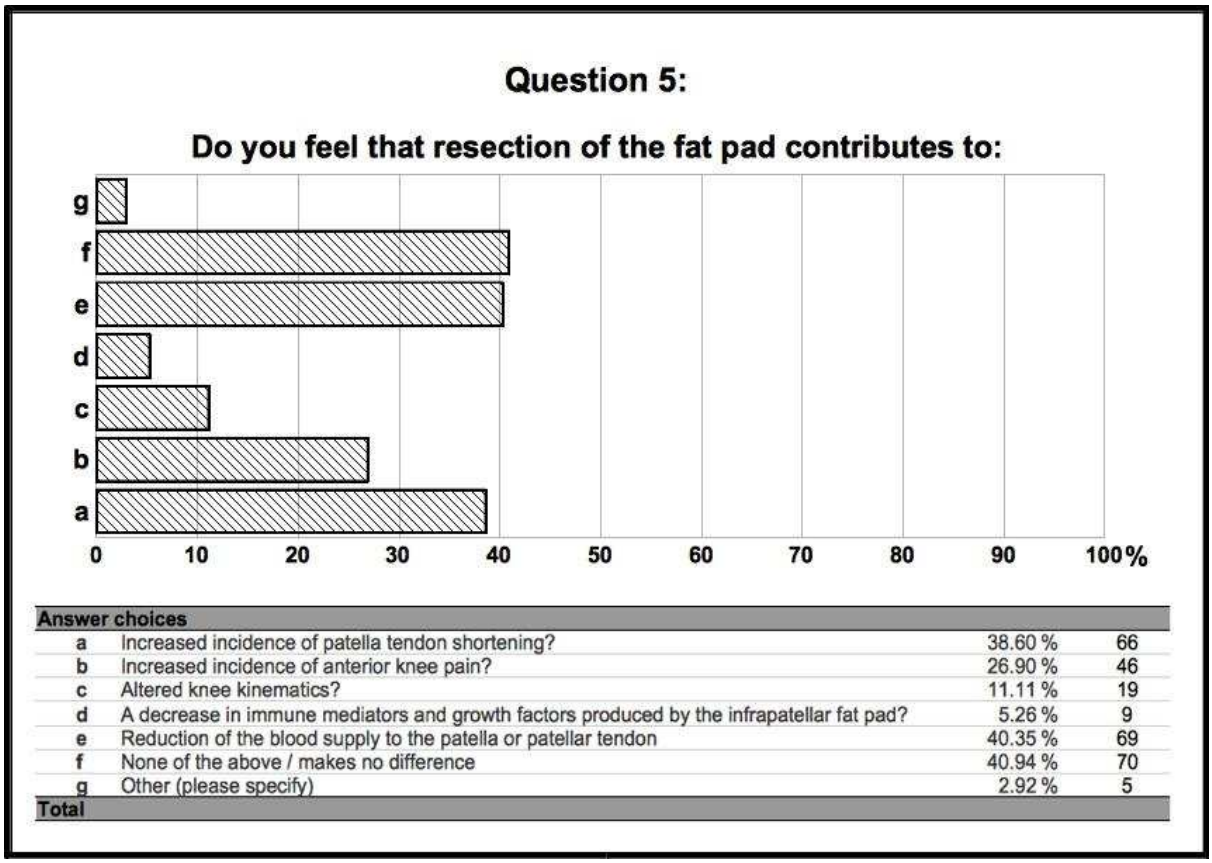
Are you aware of any guidelines or evidence regarding infrapatellar fat pad resection?



Yes (please specify)	
1	*RCTs and a recent meta-analysis*
2	*Suggestion that there is a higher incidence of baha*
3	*Recent evidence suggests preservation reduces anterior knee symptoms*
4	*The evidence is equivocal*
5	*RCTs*
6	*Several papers, equivocal results*
7	*Papers +ve and equivocal*
8	*Presentations at recent BOA in Belfast*
9	*aware of intellectual arguments for and against*
10	*As above. We published on this last year.*
11	*Some data re: patella baja from ?Denmark*
12	*I have seen some papers marginally favouring retention.*
13	*It makes no difference*
14	.
15	*Northumbria guidelines*
16	*i dont have any at hand*
17	*Couple of papers*
18	*(1) Partridge T et al. Improving patient reported outcome measures (PROMs) in total knee replacement by changing implant and preserving the infrapatellar fatpad: a quality improvement project. BMJ Qual Improv Rep 2016. (2) White L et al. The Impact of an Intact Infrapatellar Fat Pad on Outcomes after Total Knee Arthroplasty. Advances in Orthopedic Surgery 2015.*
19	*Macule in 2005 and a recent SR (White et al) but no level 1 evidence to my knowledge.*
20	*We have recently done a randomised study*
21	*better PROMS with partial resection / preservation but have never managed to achieve*
22	*I have read the literature*
23	*White L, Holyoak R, Sant J, et al. The effect of infrapatellar fat pad resection on outcomes post-total knee arthroplasty: a systematic review. Arch Orthop Trauma Surg 2016*
24	*Paper by Gwyn, Kotwal, Holt, Davies in EJOST.*
25	*Not specifically although I appreciate that it is suggested that excision can lead to retraction and patella baja.*
26	*Paper presented at BASk 2-3 years ago*
27	*Advice to preserve as much of the fat pad to avoid the risk patella baja*
28	*Paper presented at BASK from ? Cardiff suggested total preservation gave better knee scores*
29	*Various papers / posters on non resection, which are actually ones that minimally resect.*
30	*Previous paper at BASK Liverpool*
31	*Mike Reed, Hexham.*
32	*Preservation*
33	*Various papers*
34	*Baha*
35	*Actually have started recently to try and preserve all fat pad*
36	*Causes infera*
37	*some papers mentioned that fat pad resection leads to Patellar Baja*
38	*meeting discussions*
39	*Scientific publications suggesting minimise the resection*
40	*Only chat really I should look it up*

Figure 3: Bar chart representation showing the number of respondents aware of any guidelines or evidence regarding IPFP-Resection. Below the bar chart are the responses

provided by those who were aware of guidelines.



Answer choices			
a	Increased incidence of patella tendon shortening?	38.60 %	66
b	Increased incidence of anterior knee pain?	26.90 %	46
c	Altered knee kinematics?	11.11 %	19
d	A decrease in immune mediators and growth factors produced by the infrapatellar fat pad?	5.26 %	9
e	Reduction of the blood supply to the patella or patellar tendon	40.35 %	69
f	None of the above / makes no difference	40.94 %	70
g	Other (please specify)	2.92 %	5
Total			

Figure 4: Chart showing an overview of perception of the IPFP role among the survey respondents.

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