A Study of Official O.F.A. Hip Grade When Sedated, Anesthetized or Awake

Introduction

This study is based on a retrospective survey of my Orthopedic Foundation for Animals (O.F.A.) patients/clients from January, 2003 to May, 2009. The survey assured the owners of anonymity and I coded the survey to identify the patient/client in the event that later verification of data is required.

Historically, I have done thousands of O.F.A. hip evaluation radiographs since 1973. Over the past five years, I have done from 200 to 400 per year*.

The majority of the radiographs I take and submit to the O.F.A. are done with physical restraint. It is widely believed that a better O.F.A. score results when the radiograph is done awake versus sedated/anesthetized. At the 2010 North American Veterinary Conference in Orlando, Florida, I discussed this with the director of the O.F.A., Dr. Greg Keller. He commented that it is usual for unanesthetized dogs to get better scores than anesthetized/sedated dogs[a].

I recently did a survey of my own O.F.A. clients, specifically those who had come to me for resubmission of hip films (whether passing or failing). From that survey I was able to tabulate and assess data with respect to dogs who were radiographed with physical restraint only or sedated/anesthetized at my hospital as compared to the previous radiograph.

Clinical Report

As this is primarily a group study and depends upon numerous tables of data, I provided the table of data along with my assessment and discussion of that data.

You will find Figure 1 which provides the specific positioning as designated by the O.F.A. (downloaded from the O.F.A. website)[1]. Figures 2, 2a, 3 and 3a are radiographs of actual clinical cases submitted and graded by the O.F.A. These figures show prior radiographs and compare them to my resubmission radiograph. Lastly, I provide a total of eight tables of data for your information.

With these data, clinical cases and the official O.F.A. criteria for positioning, I believe conclusions will be presented which will require a close examination of our current system of O.F.A. grading. Hopefully, this information will lead to

*2005=347; 2006=410; 2007=338; 2008=294; 2009=317.

Figure 1- Standard Hip Extended VD Pelvis View as shown on the O.F.A. Hip Dysplasia Application Form

Instructions for Taking Films for OFA Dysplasia Evaluations

Radiographs should be permanently identified in the film emulsion with:

1. Registered name and/or number
2. Name of veterinarian or hospital making the film
3. Date of radiograph taken

- Pelvic evaluation are based on the standard VD view with good pelvic definition, pelvis not tilted and femurs extended and parallel
- Elbow evaluations are based on the standard flexed medial to lateral view

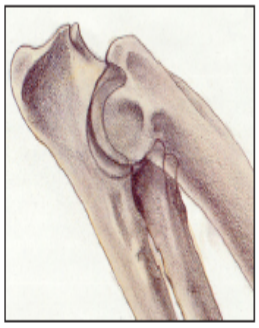

Figure 2– Initial film done elsewhere. Received an O.F.A. rating of mild dysplasia.

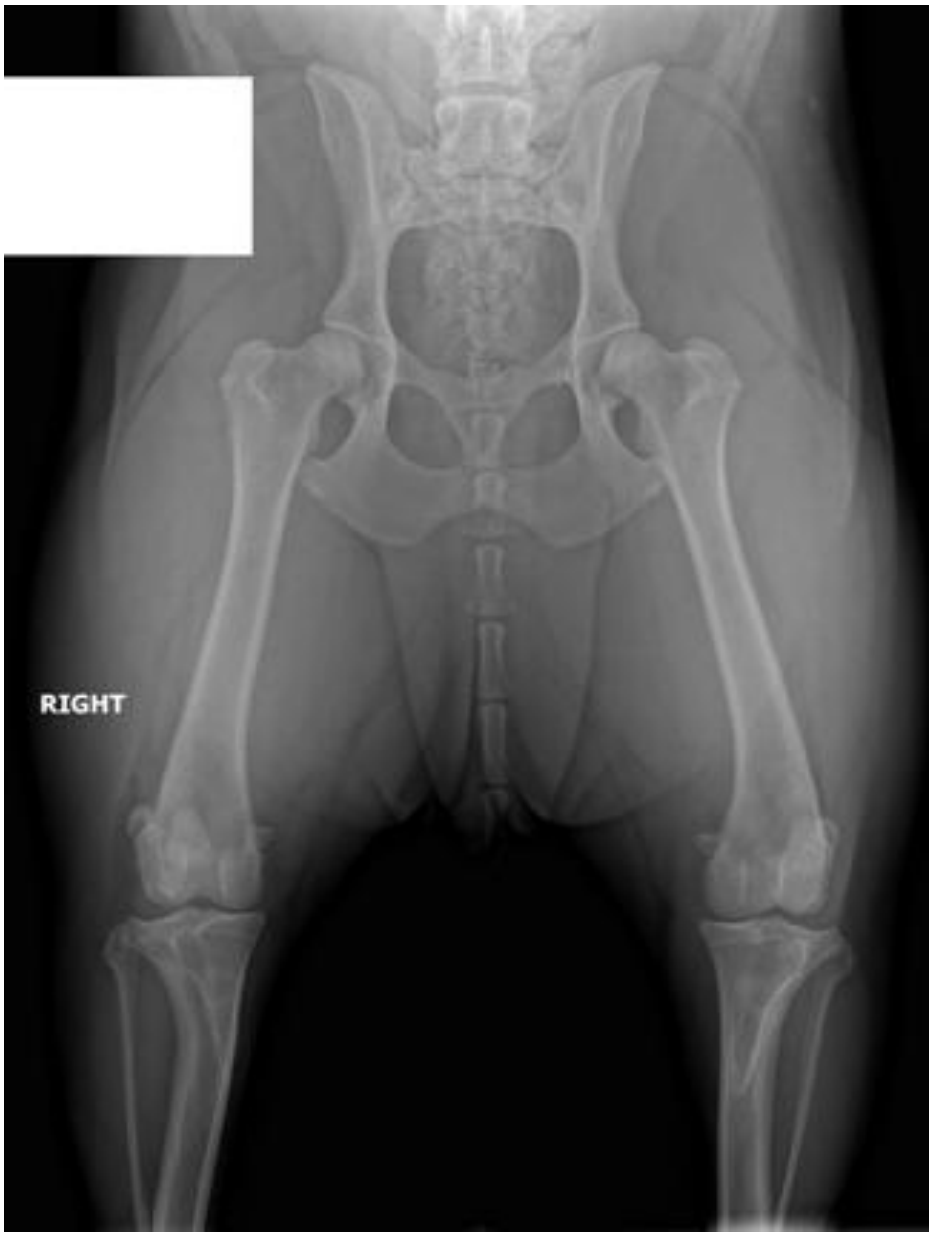

Figure 2a– Retake film done by my hospital. Received O.F.A. rating of good.

Figure 3– Initial film done elsewhere. Received O.F.A. grade of mild dysplasia.

Figure 3a– Retake film done at this hospital. Received O.F.A. grade of fair.

a greater level of accuracy and service for the dog breeder/dog fancier and, ultimately, the dog-owning public.

Discussion

The scope of this paper is limited by the fact that I had to use a retrospective study based on survey results of my own clients (Table 1) rather than an analysis of O.F.A. official records. Also, only 53 of 105 (50.47%) of the possible cases responded with reports. (Table 1a)

I believe the available data suggest the need for a much more intense survey of the variation in official O.F.A. scores with respect to anesthesia/sedation versus awake. I also believe the quality control at the O.F.A. with respect to the acceptable position to be read by O.F.A. must be examined. (Table 2)

Examine Figures 1, 2, 2a, 3 and 3a. Look closely for departure from the recommended hip extended VD pelvic position as prescribed by the O.F.A. Note symmetry or asymmetry of the obturator foramen, the position of the patellas and whether the femurs are parallel. Do you see departures in the images shown?

Figure 2 is the original radiograph of a Golden Retriever done at another veterinary clinic that was accepted by the O.F.A. and given an official grade. The image was brought to me on CD by the owner who assured me this is the radiograph that was submitted for evaluation. Please note that the left obturator foramen is markedly larger than the right and the femurs are not parallel but abducted. The patellas are also so far lateral they can be seen lateral to the lateral condyles. The femoral heads also appear angular and shallow.

Compare this image then to Figure 2A which is of the same dog using my radiographic technique. You be the judge. Which film most closely follows the published O.F.A. guidelines?

Can this possibly be the same dog? Microchip identification verified the identity.

The radiograph done “elsewhere” graded O.F.A. mild hip dysplasia.

The film I did graded O.F.A. good.

Next look at Figures 3 and 3A. This film is also of a Golden Retriever and was again brought to me on CD by the owner who assured me it was the film submitted to the O.F.A. The dog has a severely titled pelvis. It displays asymmerty and malpositioning of the obturator foramen and the wings of the ileum. The left patella is correctly on the mid-line of the femur but the right patella is lateral to the mid-line. The femurs are not parallel and the left femoral head is deeper than the right.

Table 1– Survey Questionnaire

Resubmission Data

Breed of dog _____

Previous OFA official rating _____

OFA findings/comments :

□ subluxation	□ remodeling of femoral head/neck
□ osteoarthritis/degenerative joint disease	□ shallow acetabula
□ acetabular rim/edge change	□ unilateral pathology ___left ___right
□ transitional vertebra	□ spondylosis
□ panosteitis	□ other _____

Dog/bitch was: a) awake □ b) sedated □ c) under general anesthesia (gas anesthetic) □

Film was done: a) by Dr xxxx □ b) at another veterinary clinic □

OFA official rating after retake by xxxxxxx DVM _____

OFA findings/comments :

□ subluxation	□ remodeling of femoral head/neck
□ osteoarthritis/degenerative joint disease	□ shallow acetabula
□ acetabular rim/edge change	□ unilateral pathology ___left ___right
□ transitional vertebra	□ spondylosis
□ panosteitis	□ other _____

Dog/bitch was: a) awake □ b) sedated □ c) under general anesthesia (gas anesthetic) □

Your Viewpoint on My Technique

1) My technique was:
   - Good □
   - Bad □
   - Ugly □

Rating on a scale of 0 - 10 0 1 2 3 4 5 6 7 8 9 10
Really Bad Fabulous

Your comments:

2) Would you refer others to me?
   - Yes □
   - Yes, I already have □
   - No □
   - Maybe □

What suggestions would you make to improve the level of service we provide?

Table 1a-Potential Data Pool

Number of surveys sent:	93 clients	105 dogs
Information unavailable (letter returned)	2 clients	2 dogs
Number of responses:		53 dogs

Table 2—Full Data Report

No.	Breed	Previous Grade	Off or Prelim?	OFA Comments		New Grade	
1	Golden Retriever	borderline	official	subluxation	awake	good	awake
	" " (same dog)	fair	official		sedated		
2	Kuvasz	fair	prelim		awake	excellent	awake
3	Golden Retriever	mild dysplasia	official	subluxation	awake	good	awake
4	Golden Retriever	mild dysplasia	official	subluxation	awake	good	awake
5	Labrador Retriever	mild dysplasia	official	subluxation	sedated	fair	awake
6	Labrador Retriever	fair	official		sedated	good	sedated
7	Brittany Spaniel	fair	official		sedated	good	awake
8	Labrador Retriever	mild dysplasia	official	subluxation	sedated	good	awake
9	Golden Retriever	good	prelim			excellent	awake
10	Rottweiler	fair	official		awake	fair	awake
11	Golden Retriever	good	prelim		awake	good	awake
12	Golden Retriever	good	prelim		awake	good	awake
13	Golden Retriever	fair	official		sedated	good	sedated
14	Shetland Sheepdog	(fail)	official	subluxation	sedated	fair	awake
*15	Gordon Setter		prelim		awake	good	awake
16	Rottweiler	(fail)	official	subluxation	sedated	fair	awake
17	Golden Retriever	good	prelim		awake	good	awake
18	Labrador Retriever	good	prelim		awake	good	awake
19	Mastiff	good	official		sedated	excellent	awake
20	Golden Retriever	good	prelim			good	awake
21	Briard	fair	official		sedated	good	awake
22	Golden Retriever	fair	prelim		awake	good	awake
23	Golden Retriever	(fail)	official	subluxation	sedated	fair	awake
24	Labrador Retriever		official	subluxation	sedated	good	awake
25	Rottweiler	moderate dysplasia	official	subluxation	sedated	mild dysplasia	awake
26	Standard Schnauzer	mild dysplasia	official	subluxation	sedated	good	awake
27	Rhodesian Ridgeback	excellent	prelim		awake	good	sedated
28	Bernese Mountain Dog		official	subluxation	sedated	fair	awake
29	Golden Retriever	mild dysplasia	official	subluxation	sedated	fair	awake
30	Golden Retriever	good	prelim			good	awake
31	Golden Retriever	mild dysplasia	official	subluxation	sedated	fair	awake
32	Golden Retriever	moderate dysplasia	official	subluxation	sedated	good	awake
33	Labrador Retriever	mild dysplasia	official	remodeling	awake	fair	awake
34	Golden Retriever	moderate dysplasia	official	subluxation	sedated	mild dysplasia	awake
35	Golden Retriever	borderline	official	subluxation	sedated	good	awake
				shallow acetabula			
36	Golden Retriever	fair	official		sedated	good	awake
37	Golden Retriever	borderline	official	subluxation	sedated	good	awake
38	Cardigan Welsh Corgi	mild dysplasia	official	remodeling	sedated	mild dysplasia	awake
				transitional vertebra			
39	English Springer Spaniel	mild dysplasia	official	subluxation	sedated	excellent	awake

40	Golden Retriever		official	subluxation	sedated	fair	awake
41	Golden Retriever		official	osteoarthritis	sedated	good	awake
42	Golden Retriever	fair	official		sedated	good	awake
43	Bullmastiff	mild dysplasia	official	subluxation	sedated	fair	awake
44	Golden Retriever	mild dysplasia	official	subluxation		good	awake
45	Golden Retriever	fair	prelim		awake	good	awake
46	Golden Retriever	mild dysplasia	official	subluxation	sedated	good	awake
47	Golden Retriever	mild dysplasia	prelim			good	awake
48	Ches. Bay Retriever	fair	official		sedated	fair	awake
49	Afghan Hound	mild dysplasia	official	subluxation	sedated	fair	sedated
50	Rottweiler	mild dysplasia	official	subluxation	sedated	fair	awake
51	Golden Retriever	mild dysplasia	official		awake	good	awake
52	Labrador Retriever	mild dysplasia	official	subluxation	sedated	good	awake
				shallow acetabula			
53	German Shepherd	mild dysplasia	official	subluxation	sedated	fair	awake

Again verified by microchip, Figure 3A is my radiograph taken of the same dog seen in Figure 3. Can this possibly be the same dog?

Interestingly, both films were accepted and read by the O.F.A. The original radiograph was graded O.F.A. mild hip dysplasia. My resubmission film graded O.F.A. fair.

The O.F.A. accepted both images and made official reports to the owners in both instances ergo my suggestion that an overhaul of O.F.A. quality control is of paramount importance.

With respect to the various breakdown of data, the following are my results:

1) Table 3: Anesthetized/Sedated vs. Physical Restraint:

   6.45% (2/31) of the submissions received the same O.F.A. score.

   93.53% (29/31) went up one grade or more, of these 6.45% (2/31) went up four grades

2) Table 4: Physical Restraint vs. Physical Restraint:

   38.46% (5/13) had no change in grade

   61.54% (8/13) went up one to three grades

3) Table 5: Physical Restraint vs. Anesthetized/Sedated Resubmit:

   100% (1/1) dropped one grade (preliminary grade vs adult official grade)

4) Table 6: Sedated vs. Sedated:

   100% (3/3) went up one or two grades

5) Table 7: Original unknown form of restraint vs. Physical Restraint Resubmission:

   40% (2/5) received the same OFA score

   20% (1/5) went up one grade

   40% (2/5) went up three grades

6) Table 8: Tabulation of data from the full study and no consideration of physical restraint vs. sedated/anesthetized:

   1.92% (1/52) dropped one grade

   17.30% (9/52) received the same grade

   80.75% (43/52) went up one to four grades

Table 3—Anesthetized or Sedated vs. Awake

No.	Breed	Anes/Sedated Grade	Awake Grade	Grades Changed
1	Golden Retriever	fair	good	+1
5	Labrador Retriever	mild dysplasia	fair	+2
7	Brittany Spaniel	fair	good	+1
8	Labrador Retriever	mild dysplasia	good	+3
14	Shetland Sheepdog	fail?	fair	+1 (at least)
16	Rottweiler	fail?	fair	+1 (at least)
19	Mastiff	good	excellent	+1
21	Briard	fair	good	+1
23	Golden Retriever	fail?	fair	+1 (at least)
24	Labrador Retriever	subluxation (fail?)	good	+2 (at least)
25	Rottweiler	moderate dysplasia	mild dysplasia	+1
26	Standard Schnauzer	mild dysplasia	good	+3
28	Bernese Mountain Dog	subluxation (fail?)	fair	+1 (at least)
29	Golden Retriever	mild dysplasia	fair	+2
31	Golden Retriever	mild dysplasia	fair	+2
32	Golden Retriever	moderate dysplasia	good	+4
34	Golden Retriever	moderate dysplasia	mild dysplasia	+1
35	Golden Retriever	borderline	good	+2
36	Golden Retriever	fair	good	+1
37	Golden Retriever	borderline	good	+2
38	Cardigan Welsh Corgi	mild dysplasia	mild dysplasia	0
39	English Springer Spaniel	mild dysplasia	excellent	+4
40	Golden Retriever	subluxation (fail?)	fair	+1 (at least)
41	Golden Retriever	osteoarthritis (fail?)	good	+2 (at least)
42	Golden Retriever	fair	good	+1
43	Bullmastiff	mild dysplasia	fair	+2
46	Golden Retriever	mild dysplasia	good	+3
48	Ches. Bay Retriever	fair	fair	0
50	Rottweiler	mild dysplasia	fair	+2
52	Labrador Retriever	mild dysplasia	good	+3
53	German Shepherd	mild dysplasia	fair	+2

Table 3a---Tabulated Data—Anesthetized or Sedated vs. Awake

Grades Changed	Number	Percentage
Negative Change	0 of 31	0%
No Change	2 of 31	6.45%
+1 (at least)	13 of 31	41.93%
+2	10 of 31	32.25%
+3	4 of 31	12.90%
+4	2 of 31	6.45%

Table 4- Original Awake vs. Resubmitted Awake

No.	Breed	Original Grade	Resubmitted Grade	Grades Changed
1	Golden Retriever	borderline	good	+2
2	Kuvasz	fair (preliminary)	excellent	+2
3	Golden Retriever	mild dysplasia	good	+3
4	Golden Retriever	mild dysplasia	good	+3
10	Rottweiler	fair	fair	0
11	Golden Retriever	good (preliminary)	good	0
12	Golden Retriever	good (preliminary)	good	0
17	Golden Retriever	good (preliminary)	good	0
18	Labrador Retriever	good (preliminary)	good	0
22	Golden Retriever	fair (preliminary)	good	+1
33	Labrador Retriever	mild dysplasia	fair	+2
45	Golden Retriever	fair	good	+1
51	Golden Retriever	mild dysplasia	good	+3

Table 4a- Tabulated Data- Awake vs. Awake

Grades Changed	Number	Percentage
Negative Change	0 of 13	0%
No Change	5 of 13	38.46%
+1 (at least)	2 of 13	15.38%
+2	3 of 13	23.08%
+3	3 of 13	23.08%
+4	0 of 13	0%

grade decreased or stayed the same: 38.46%

grade improved: 61.54%

Table 5- Awake vs. Sedated/Anesthetized

No.	Breed	Original Grade	Resubmitted Grade	Grades Changed
27	Rhodesian Ridgeback	excellent (preliminary)	good	-1

Table 5a- Tabulated Data Awake vs. Anesthetized or Sedated

Grades Changed	Number	Percentage
Negative Change	1 of 1	100%
No Change	0 of 1	0%
+1 (at least)	0 of 1	0%
+2	0 of 1	0%
+3	0 of 1	0%
+4	0 of 1	0%

grade decreased or stayed the same: 100%

grade improved: 0%

Table 6- Sedated vs Sedated

No.	Breed	Original Grade	Resubmitted Grade	Grades Changed
6	Labrador Retriever	fair	good	+1
13	Golden Retriever	fair	good	+1
49	Afghan Hound	mild dysplasia	fair	+2

Table 6a- Tabulated Data Sedated vs Sedated

Grades Changed	Number	Percentage
Negative Change	0 of 3	0%
No Change	0 of 3	0%
+1 (at least)	2 of 3	66.66%
+2	1 of 3	33.33%
+3	0 of 3	0%
+4	0 of 3	0%

grade decreased or stayed the same: 0%

grade improved: 100%

Table 7- Awake/Sedated Unknown on Original Submission vs Awake on Resubmission

No.	Breed	Original Grade	Resubmitted Grade	Grades Changed
9	Golden Retriever	good (preliminary)	excellent	+1
20	Golden Retriever	good (preliminary)	good	0
30	Golden Retriever	good (preliminary)	good	0
44	Golden Retriever	mild dysplasia	good	+3
47	Golden Retriever	mild dysplasia (prelim)	good	+3

Table 7a- Tabulated Data-Unknown Original vs Awake Resbumission

Grades Changed	Number	Percentage
Negative Change	0 of 5	0%
No Change	2 of 5	40%
+1 (at least)	1 of 5	20%
+2	0 of 5	0%
+3	2 of 5	40%
+4	0 of 5	0%

grade decreased or stayed the same: 40%

grade improved: 60%

Table 8- Comparison of Original vs Submission Regardless of Sedation/Awake

No.	Breed	Previous Grade	New Grade	Change
1	Golden Retriever	borderline	good	+1 (at least)
	" " (same dog)	fair		
2	Kuvasz	fair	excellent	+2
3	Golden Retriever	mild dysplasia	good	+3
4	Golden Retriever	mild dysplasia	good	+3
5	Labrador Retriever	mild dysplasia	fair	+2
6	Labrador Retriever	fair	good	+1
7	Brittany Spaniel	fair	good	+1
8	Labrador Retriever	mild dysplasia	good	+3
9	Golden Retriever	good	excellent	+1
10	Rottweiler	fair	fair	0
11	Golden Retriever	good	good	0
12	Golden Retriever	good	good	0
13	Golden Retriever	fair	good	+1
14	Shetland Sheepdog	(fail) subluxation	fair	+1 (at least)
16	Rottweiler	(fail) subluxation	fair	+1 (at least)
17	Golden Retriever	good	good	0
18	Labrador Retriever	good	good	0
19	Mastiff	good	excellent	+1
20	Golden Retriever	good	good	0
21	Briard	fair	good	+1
22	Golden Retriever	fair	good	+1
23	Golden Retriever	(fail) subluxation	fair	+1 (at least)
24	Labrador Retriever	(fail?) subluxation	good	+2
25	Rottweiler	moderate dysplasia	mild dysplasia	+1
26	Standard Schnauzer	mild dysplasia	good	+3
27	Rhodesian Ridgeback	excellent	good	-1
28	Bernese Mountain Dog	(fail?) subluxation	fair	+1 (at least)
29	Golden Retriever	mild dysplasia	fair	+2
30	Golden Retriever	good	good	0
31	Golden Retriever	mild dysplasia	fair	+2
32	Golden Retriever	moderate dysplasia	good	+4
33	Labrador Retriever	mild dysplasia	fair	+2
34	Golden Retriever	moderate dysplasia	mild dysplasia	+1
35	Golden Retriever	borderline	good	+2
36	Golden Retriever	fair	good	+1
37	Golden Retriever	borderline	good	+2
38	Cardigan Welsh Corgi	mild dysplasia	mild dysplasia	0
39	English Springer Spaniel	mild dysplasia	excellent	+4

40	Golden Retriever	(fail?) subluxation	fair	+1 (at least)
41	Golden Retriever	(fail?) osteoarthritis	good	+2 (at least)
42	Golden Retriever	fair	good	+1
43	Bullmastiff	mild dysplasia	fair	+2
44	Golden Retriever	mild dysplasia	good	+3
45	Golden Retriever	fair	good	+1
46	Golden Retriever	mild dysplasia	good	+3
47	Golden Retriever	mild dysplasia	good	+3
48	Ches. Bay Retriever	fair	fair	0
49	Afghan Hound	mild dysplasia	fair	+2
50	Rottweiler	mild dysplasia	fair	+2
51	Golden Retriever	mild dysplasia	good	+3
52	Labrador Retriever	mild dysplasia	good	+3
53	German Shepherd	mild dysplasia	fair	+2

**This patient was eliminated because no previous O.F.A. score was reported.

Table 8a- Comparison with No Consideration as to Anesthetized/Sedated/Awake

Grades Changed	Number	Percentage
Negative Change	1 of 52	1.93%
No Change	9 of 52	17.30%
+1 (at least)	18 of 52	34.62%
+2	13 of 52	25.0%
+3	9 of 52	17.31%
+4	2 of 52	3.84%

grade decreased or stayed the same: 19.23%

grade improved: 80.77%

From these tables it seems that in my hands dogs previously sedated/anesthetized then resubmitted with physical restraint have a 93.54 % chance (29/31) to receive a higher official O.F.A. score. (Table 3)

When physical restraint versus physical restraint resubmissions are looked at, 61.54% (8/13) went up from one to 3 grades on their official O.F.A. score. (Table 4)

When the one case of physical restraint versus sedated/anesthetized resubmission is reviewed, 100% (1/1) went down one grade. (Table 5)

When sedated versus sedated resubmissions were compared (Table 6) 100% (3/3) went up one or two grades.

In Table 7 (unknown form of restraint on original submission versus awake), 40% (2/5) received the same O.F.A. score while the other 60% (3/5) went up one or three grades.

In Table 8 (no consideration of anesthesia/sedation/awake) the following results were obtained when resubmitted by me:

1.93% (1/52) went down one grade

17.30% (9/52) received the same grade

34.62% (18/52) improved one grade

25.00% (13/52) improved two grades

17.31% (9/52) improved three grades

3.84% (2/52) improved four grades

In total, 80.75% of all dogs resubmitted went up one to four grades based on radiographs accepted and read by the O.F.A.

Summary

My data suggest Dr. Keller's observation that awake dogs grade better than anesthetized/sedated dogs[a] has some validity but, in my viewpoint, this is not the only factor.

The data in 100% of sedated versus sedated (3/3)dogs went up one or two grades. When comparing physical restraint to physical restraint resubmissions, 61.54% (8/13) went up one to three grades. From this I glean the concept that quality control at the O.F.A. is an important part of the issue and needs to be tightened. Quality control must be stringent with respect to precise VD hip extended radiographic positioning per the O.F.A. guidelines and per the article "Tips and Techniques for Pelvic Radiography" in the July 2009 issue of

Clinician's Brief by Dr. Laura Armbrust.[2]

Endnotes

[a]Dr. Greg Keller, Director, Orthopedic Foundation for Animals, personal communication.

References

[1]The Orthopedic Foundation for Animals, Hip and Elbow Dysplasia Application, online reference www.offa.org

[2]Armbrust, Laura, Tips & Techniques for Pelvic Radiography. *Clinician's Brief* 2009 July; 7(7): 51-54.